English

FUJITSU Software BS2000

MAREN V12.5

Tape Administration in BS2000
MAREN Administration

System Administrator Guide

Edition July 2017

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Certified documentation according to DIN EN ISO 9001:2008

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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1 Preface

The software product MAREN is used to manage tape inventories in a data center. It stores all information on the tapes in a separate MAREN catalog, which can be set up as a central catalog for several BS2000 systems.

Close cooperation of MAREN with other BS2000 software products, e.g. HSMS/ARCHIVE, enables the data center to be organized ideally.

1.1 Objectives and target groups of this manual

The “MAREN System Administrator Guide” describes the installation and configuration of MAREN by BS2000 systems support, as well as the management of tapes and of MAREN in the data center by the privileged MAREN user, in particular the administrator programs MARENADM and MARENEKM.
The manual is consequently intended for BS2000 systems support, the operating staff in the data center, and the privileged MAREN user.

The “MAREN User Guide” [1] provides an introduction to the management of tapes in the data center and the management of tapes in BS2000 with MAREN. This is followed by a description of the MAREN functions for the nonprivileged MAREN users, in particular the MAREN user program.
It forms the basis for understanding this system administrator manual.

1.2 Summary of contents

This manual consists of the main parts:

- “Installation and configuration of MAREN”
- “Management of tapes and MAREN in the data center” by the MAREN administrator, in particular:
  - MAREN catalog, tape management, MAREN network, locations, interaction of MAREN and BS2000 software products and archive systems, MAREN exits
  - MARENADM administrator program
  - Managing encryption keys with the MARENEKM administrator program

In order to use the SDF statements and commands, you will require a basic knowledge of the SDF dialog interface. The command syntax and all BS2000 commands which are referenced in this manual are described in the “Commands” manual [5]. *Exception*: The commands for processing the MAREN TFT, see the “MAREN User Guide” [1]. For more in-depth information on SDF, please refer to the “SDF Dialog Interface” [20].

Readme file

The functional changes to the current product version and revisions to this manual are described in the product-specific Readme file.

Readme files are available to you online in addition to the product manuals under the various products at *http://manuals.ts.fujitsu.com*. You will also find the Readme files on the Softbook DVD.

Information under BS2000

When a Readme file exists for a product version, you will find the following file on the BS2000 system:

`SYSRME.<product>.<version>.<lang>`

This file contains brief information on the Readme file in English or German (<lang>=E/D). You can view this information on screen using the `SHOW-FILE` command or an editor. The `/SHOW-INSTALLATION-PATH INSTALLATION-UNIT=<product>` command shows the user ID under which the product's files are stored.

Supplementary product information

Current information, version and hardware dependencies and instructions for installing and using a product version are contained in the associated Release Notice. These Release Notices are available online at *http://manuals.ts.fujitsu.com*.

1.3 Changes since the last edition of the manual

This manual contains the following major changes compared to the preceding manual.

- The MAREN manuals have been completely revised and restructured in the “MAREN User Guide” and the “MAREN System Administrator Guide”.
- Adaptation to BS2000 OSD/BC V11.0.
- For the operating modes in MAREN, only the terms “shared mode” (previously also called RFA mode) and “exclusive mode” (previously also called SPD mode) are now used.
- Changes in the MAREN and MARENADM statement PRINT-VOLUME-ATTRIBUTES:
  - Fields which were highlighted in the SELECT mask are labeled with s in the follow-on masks.
  - Fields which were highlighted in the SORT mask are labeled with o in the follow-on masks.
- Free tapes are always taken from the free tape pool with the name *NO in the MAREN statement RESERVE-FREE-VOLUME.
- In the MAREN statement SHOW-VOLUME-ATTRIBUTES, the S variable LAST-ACCESS-CPU-NAME has been renamed LAST-ACCESS-HOSTNAME. For compatibility reasons, the S variable LAST-ACCESS-CPU-NAME can still be used with its old meaning.

For the privileged user

- New MARENADM statement EDIT-MAREN-PARAMETERS.
- New system-specific MAREN parameter OVERRULE-LOC.
- The MARENADM statement ADD-PRIVATE-VOLUME has been renamed IMPORT-FOREIGN-VOLUME. For compatibility reasons, ADD-PRIVATE-VOLUME can still be used with its old meaning.
- In the MARENADM statements ADD-RESERVED-VOLUME, MODIFY-TAPE-SET-ATTRIBUTES, and MODIFY-VOLUME-ATTRIBUTES, the ADMINISTRATOR-FIELD and ADMINISTR-FIELD-2 operands are case-sensitive.
- In the MARENADM statement CHANGE-LOGGING-FILE, `FILE-NAME = <partial-filename 2..30>` can be used to determine the prefix of the new logging file.
- New operand CHECK-TSOSCAT in thr MARENADM statement FREE-VOLUME.
- In the MARENADM statement MODIFY-MAREN-PARAMETERS, the DEFAULT-DENSITY operand is obsolete and is no longer offered in guided dialog. The value “T6250” is always used. The operand is no longer output for SHOW-MAREN-PARAMETERS.
- In the MAREN statements MODIFY-VOLUME-ATTRIBUTES, SHOW-FREE-VOLUMES, SHOW-VOLUME-ATTRIBUTES, and SHOW-VSNS, the operands, S variables, and output fields with the name LAST-ACCESS-CPU-NAME have been renamed LAST-ACCESS-HOSTNAME. For compatibility reasons, the LAST-ACCESS-CPU-NAME operands and S variables can still be used with their old meaning.
- In the reservation file (location management, MARENLM), an entry field `Info` has been inserted to include user information.
- The system-specific MAREN parameter SHOW-INFORMATION has the new default value `NORMAL`.

1.4 Notational conventions

Because certain names are frequently used, for the sake of simplicity and clarity the following abbreviations are used:

- **MAREN** for the MAREN system executing in the BS2000 operating system, controlled by the control programs MARENCP and MARENUCP.

The strings <date>, <time> and <version> in examples refer to the current outputs for the date, time, and version of a software product when the examples are otherwise independent of date, time, and version.

The string <ver> in the file name specifies the current version of MAREN, in this edition <ver>: 125, i.e. MAREN V12.5.

The following notational conventions are used in this manual:

Bold type Wherever syntax representations are explained, the lines that are currently being explained are shown in bold type. The text entered on the screen in examples which display input and output is also shown in bold type.

`Example` Sample inputs and outputs are also shown in typewriter font.

For notes on particularly important information

This symbol designates special information that points out the possibility that data can be lost or that other serious damage may occur.

[ ] References to other publications within the text are given in abbreviated form followed by numbers; the full titles are listed in the “References” section at the back of this manual.

The gray highlighting in the syntax representations means that the statement or operand is only available to the ADA. The DA cannot see the operand concerned on the SDF interface.

2 Installing and configuring MAREN

This chapter describes how MAREN is installed and configured in a BS2000 system, and how the MAREN environment is provided in the local data center and in a MAREN network.

2.1 Installing MAREN

MAREN must be installed in the BS2000 system or in any BS2000 system of the MAREN network using IMON.

2.1.1 Preparations

MAREN V12.5 can execute in BS2000 OSD/BC V10.0 and higher.
Prerequisites for MAREN operation are:

- the software product SORT (BS2000), among other things for generating printer lists (see the “SORT” manual [22]).
- the software product RFA when access is to take place to the central MAREN catalog from remote systems in the MAREN network in shared mode (see the “RFA” manual [18].
- the software product LMS (BS2000), if the parameter sets are managed in libraries in the PRINT-VOLUME-ATTRIBUTES statement (see the “LMS” manual [16]).
- the software product HIPLEX MSCF for information transfer between systems in the MAREN network in the case of some MARENADM and MARENEKM statements (see the “HIPLEX MSCF” manual [12]).

User ID SYSMAREN

The user ID SYSMAREN is configured by default in BS2000 for operating MAREN. SYSMAREN is configured with the TAPE-ADMINISTRATION and TAPE-KEY-ADMINISTRATION privileges. If the software product SECOS is in use, the TAPE-ADMINISTRATION and TAPE-KEY-ADMINISTRATION privileges can be assigned to any user IDs, see page 27.

The files of MAREN are installed under SYSMAREN. The MARENCP control program must be started under SYSMAREN later on.

The account number under which the MARENCP task is subsequently started should have the TP authorization (entry in the user catalog: MAX-ALLOWED-CATEGORY=TP).

Providing storage space for the MAREN catalog files

Depending on the mode of operation selected (exclusive or shared mode), storage space on the selected disks must be allocated for the files of the MAREN catalog.

The MAREN catalog files can be stored under any user ID, but it is recommended that you make the catalog available under the user ID SYSMAREN. The advantage to this approach is that it enables MARENCP to access the catalog files without having to make them shareable. In this case, MARENADM can only access the catalog files directly under TSOS or SYSMAREN.

To avoid scattering the MAREN catalog files and thereby impairing performance, sufficiently large values should be selected when allocating primary and secondary storage areas.

The size of the individual files can be estimated based on the following criteria:

- Volume catalog (see section “Volume catalog” on page 70)
  In the case of an NK-ISAM catalog, a PAM block contains one catalog entry. This size must be taken into consideration in the primary allocation. In these cases, 6000 MAREN catalog entries will require 6000 PAM pages.
- Logging file (see section “Logging files” on page 76)
  One PAM block contains one logging record. Since one logging record is written each time an catalog entry is changed, the size of the file steadily increases. Thus, at least two new logging records are added just to create a tape output file. Therefore, when allocating space, a rough estimate should be made of how many updates will be made in the catalog entries during the period the logging file remains assigned. For data security reasons and to avoid adversely affecting performance, each system in the MAREN network should have its own logging file. The block size selected for the logging file can also vary.

2.1.2 Installation components

Components with an asterisk (“*”) in front of their name are, by default, expected to be found under the TSOS user ID. All other components are expected under the SYSMAREN user ID. All files under TSOS must be cataloged with USER-ACCESS=*ALL-USERS and ACCESS=*READ.

Component	Meaning
*SIPLIB.MAREN.<ver>	Library containing privileged macros and SPL includes
SYSDAT.MAREN.<ver>.CATALOG	Empty MAREN catalog in NK-ISAM format
SYSENT.MAREN.<ver>.MARENUCP	Start procedure for MARENUCP
SYSENT.MAREN.<ver>.SHAR.MARENCP	Start procedure for MARENCP (shared mode)
SYSENT.MAREN.<ver>.EXCL.MARENCP	Start procedure for MARENCP (exclusive mode)
*SYSFHS.MAREN.<ver>.D *SYSFHS.MAREN.<ver>.E	FHS module library (German) FHS module library (English)
SYSLIB.MAREN.<ver>	Library containing MAREN components and MAREN linkage modules
*SYSLNK.MAREN.<ver>	Library containing all TU link and load modules (LLMs) for MAREN, MARENADM, MARENCP and MARENUCP
*SYSLNK.MAREN.<ver>.TPR	Library from which the MAREN subsystem is loaded on /390 servers. This contains the MAREN subsystem and the TPR link and load modules.
*SKMLNK.MAREN.<ver>.TPR	Library from which the MAREN subsystem is loaded on x86 servers. This contains the MAREN subsystem and the TPR link and load modules.
*SYSMES.MAREN.<ver>	MAREN message file
*SYSNRF.MAREN.<ver>	NOREF file
*SYSPRC.MAREN.<ver>	Procedures for starting MARENCP in a multiprocessor environment with joint resources
SYSPRG.MAREN.<ver>.MAREN	MAREN user program (prephase)
SYSPRG.MAREN.<ver>.MARENADM	MARENADM administrator program (prephase)
SYSPRG.MAREN.<ver>.MARENCP	MARENCP control program (prephase)
SYSPRG.MAREN.<ver>.MARENUCP	Automatic free tape allocation facility MARENUCP (prephase)
*SYSREP.MAREN.<ver>	Correction file
*SYSRMS.MAREN.<ver>	RMS selectable unit for MAREN

(part 1 of 2)

Component	Meaning
*SYSSDF.MAREN.<ver>.USER	User syntax file (START-MARENADM command) for systems without SECOS
*SYSSDF.MAREN.<ver>	SDF syntax file
*SYSSII.MAREN.<ver>	Structure and installation information file for installation with IMON
SYSSPR.MAREN.<ver>	Library containing implementation procedures for the START commands
*SYSSSC.MAREN.<ver>	Subsystem declaration

(part 2 of 2)

The following files are also supplied:

Component	Meaning
*SYSFGM.MAREN.<ver>.D	Release Notice (German)
*SYSFGM.MAREN.<ver>.E	Release Notice (English)

2.1.3 Installation with IMON

MAREN is installed with the software product IMON (see the “IMON” manual [14]). No permanent file names are required for IMON. The so-called structure and installation information for IMON is supplied with MAREN. In this file, each supplied MAREN file is assigned a logical ID under which it can be accessed. The following logical IDs are used for the MAREN product files:

File name	Logical ID
MAREN.BULLETIN [1]	SYSDAT.BULLETIN
MAREN.LAYOUT.EXPORT-RECEIPT [1]	SYSDAT.EXPORT
MAREN.LOCK.FILE [1]	SYSDAT.LOCKFILE
MAREN.PARAMETER-FILE [1]	SYSPAR.PRINT
SIMLNK.MAREN.<ver>.TPR	SYSLNK.TPR
SIPLIB.MAREN.<ver>	SIPLIB
SKMLNK.MAREN.<ver>.TPR	SYSLNK.TPR
SYSDAT.MAREN.<ver>.CATALOG	SYSDAT.VOID-CAT
SYSENT.MAREN.<ver>.MARENUCP	SYSENT.UCP
SYSENT.MAREN.<ver>.SHAR.MARENCP	SYSENT.SHAR
SYSENT.MAREN.<ver>.EXCL.MARENCP	SYSENT.EXCL
SYSFGM.MAREN.<ver>.D	SYSFGM.D
SYSFGM.MAREN.<ver>.E	SYSFGM.E
SYSFHS.MAREN.<ver>.D SYSFHS.MAREN.<ver>.E	SYSFHS.D SYSFHS.E
SYSLIB.MAREN.<ver>	SYSLIB
SYSLNK.MAREN.<ver>	SYSLNK
SYSLNK.MAREN.<ver>.TPR	SYSLNK.TPR
SYSMES.MAREN.<ver>	SYSMES
SYSNRF.MAREN.<ver>	SYSNRF
SYSPRC.MAREN.<ver>	SYSPRC
SYSPRG.MAREN.<ver>.MAREN	SYSPRG.MAREN
SYSPRG.MAREN.<ver>.MARENADM	SYSPRG.MARENADM
SYSPRG.MAREN.<ver>.MARENCP	SYSPRG.MARENCP
SYSPRG.MAREN.<ver>.MARENUCP	SYSPRG.MARENUCP
SYSREP.MAREN.<ver> [1]	SYSREP
SYSRMS.MAREN.<ver>	SYSRMS

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File name	Logical ID
SYSSDF.MAREN.<ver>.USER	SYSSDF.USER
SYSSDF.MAREN.<ver>	SYSSDF
SYSSII.MAREN.<ver>	SYSSII
SYSSPR.MAREN.<ver>	SYSSPR
SYSSSC.MAREN.<ver>	SYSSSC

(part 2 of 2)

[1] Dummy files (dummy release items)

Dummy release items

In addition to the product files supplied with MAREN V12.5, there are also dummy release items for which a logical name is also allocated (marked with "[1]" in the overview above). MAREN has five dummy release items (their default names are given in brackets):

MAREN bulletin	($SYSMAREN.MAREN.BULLETIN)
Export receipt layout	($SYSMAREN.MAREN.LAYOUT.EXPORT-RECEIPT)
MAREN print parameters	($SYSMAREN.MAREN.PARAMETER-FILE)
MAREN lock file	($SYSMAREN.MAREN.LOCK.FILE)
MAREN correction file	($TSOS.SYSREP.MAREN.<ver>)

The first three files are optional and can be created if and when needed. The lock file is opened by MARENCP when booting in OUTPUT mode. The sole function of this empty file is to prevent MARENCP from being loaded more than once on the same system. The correction file is generated from the RMS selectable unit during the standard installation of MAREN.

The names for these MAREN product files can be freely selected when a different file name is assigned to the logical ID using the SET-INSTALLATION-PATH command. However, this can be done only under a user ID with the SUBSYSTEM-MANAGEMENT privilege.

Example

```
/SET-INSTALLATION-PATH LOGICAL-ID=SYSDAT.BULLETIN,
     PATH-NAME=$SYSMAREN.USERINFO,INSTALLATION-UNIT=MAREN
```

The MAREN bulletin will be read and output from $SYSMAREN.USERINFO after the MAREN and MARENADM programs are loaded.

Before a new path name can be assigned to the MAREN lock file (logical ID SYSDAT.LOCKFILE), MARENCP must first be terminated on the relevant system.

The current names of the MAREN files can be queried with the following command:

```
/SHOW-INSTALLATION-PATH INSTALLATION-UNIT=MAREN
```

By also specifying a logical ID, the query can be restricted to a particular MAREN file. For instance, the following command allows you to query the name of the MAREN bulletin:

```
/SHOW-INSTALLATION-PATH INSTALLATION-UNIT=MAREN,LOGICAL-ID=SYSDAT.BULLETIN
```

2.2 Configuring MAREN

2.2.1 Authorization structure in MAREN

BS2000 systems support uses privilege assignment to define which user ID receives an authorization for tape management, see the “System Administration” manual [8]. The privilege provides authorization to perform the corresponding administration tasks of MAREN.

The MAREN administrator work on a user ID which has the privilege TAPE-ADMINISTRATION. The encryption key administrator work on a user ID which has the privilege TAPE-KEY-ADMINISTRATION.
If the TAPE-KEY-ADMINISTRATION privilege was not assigned to another user ID, it is assigned to the SYSMAREN system ID. In this case the MAREN administrator also performs the tasks of the encryption key administrator.

Some tasks additionally require a particular user ID or the operator role which is entered in the system-specific MAREN parameters is also required for some tasks. The default is the operator role SYSMAREN.

The table below shows the minimum authorization which a MAREN user (or his/her user ID) must have in order to work with the various MAREN components and MARENADM statements.

MAREN components or MARENADM statements	**Minimum authorization**
MAREN user program	STD-PROCESSING
MARENADM administrator program	TAPE-ADMINISTRATION privilege
MARENEKM administrator program	TAPE-KEY-ADMINISTRATION privilege
MARENCP control program	TAPE-ADMINISTRATION privilege
Automatic free tape allocation MARENUCP	Operator role which is defined in the MAREN parameters (default: SYSMAREN) TAPE-ADMINISTRATION privilege
MARENLM utility routine	TAPE-ADMINISTRATION privilege
MARENADM statements: – ADD-RESERVED-VOLUMES VOLUME = *BY-TSOSCAT – CHECK-TSOSCAT – INITIALIZE-VOLUMES	 User ID TSOS User ID TSOS Operator role which is defined in the MAREN parameters (default: SYSMAREN) TAPE-ADMINISTRATION privilege

TAPE-ADMINISTRATION privilege

The privilege TAPE-ADMINISTRATION authorizes an user ID to perform tape management tasks.

- In a BS2000 system using the software product SECOS
  The software product SECOS enables the standard privilege assignment of BS2000 to be changed. Systems support can allocate the TAPE-ADMINISTRATION privilege to any user ID.
- In a BS2000 system without SECOS
  In addition to TSOS, the user ID SYSMAREN is by default configured with the TAPE-ADMINISTRATION privilege.

The MARENADM statements CHECK-TSOSCAT and ADD-RESERVED-VOLUMES with the VOLUME=*BY-TSOSCAT operand can only be entered under the system user ID TSOS.

MARENADM can be started under any IDs if systems support makes the user syntax file `SYSSDF.MAREN.<ver>.USER` supplied available for these IDs and has assigned an administrator password (see the MARENADM statements MODIFY-MAREN-PARAMETERS and MODIFY-GLOBAL-PARAMETERS). MAREN users legitimate themselves as the MAREN administrator by entering the password in their password table (command ADD-PASSWORD).

TAPE-KEY-ADMINISTRATION privilege

When tape encryption is used, the TAPE-KEY-ADMINISTRATION privilege authorizes a user ID to manage the encryption keys of its own domain.

- In a BS2000 system using the software product SECOS
  The chargeable software product SECOS enables the standard privilege assignment of BS2000 to be changed. Systems support can allocate the privilege TAPE-KEY-ADMINISTRATION to any user ID.
- In a BS2000 system without SECOS
  The user ID SYSMAREN is by default configured with the TAPE-KEY-ADMINISTRATION privilege.

Operator role

For MARENUCP and the MARENADM statement INITIALIZE-VOLUMES, a particular operator role is required for the connection to UCON. This operator role is entered in the system-specific MAREN parameters (the default is SYSMAREN). Under the SYSPRIV user ID this operator role must be configured once for the authorized user ID using the following commands, e.g. for SYSMAREN:

```
/CREATE-OPERATOR-ROLE OPERATOR-ROLE=SYSMAREN,ROUTING-CODES=(A,E,G,P,T)
/MODIFY-OPERATOR-ATTRIBUTES USER-ID=<userid>,ADD-OPERATOR-ROLE=SYSMAREN
```

If the operator role SYSMAREN is already configured, check whether all routing codes (especially the routing code G) are assigned. You can assign the missing routing codes as follows:

```
/MODIFY-OPERATOR-ROLE OPERATOR-ROLE=SYSMAREN,ADD-ROUTING-CODES=<code>
```

2.2.2 Configuration on the local system

MAREN subsystem

The MAREN subsystem is added to the current subsystem catalog when MAREN is installed with IMON. The subsystem declaration of MAREN is contained in the SYSSSC.MAREN.<ver> file. The MAREN subsystem must be started with /START-SUBSYSTEM SUBSYSTEM-NAME=MAREN when the BS2000 system is started.

Message file

The message file of MAREN is entered in the MIP parameter file and enabled by MIP when MAREN is installed with IMON.

The message file can also be included in the startup parameter service by adding it to the message file in the system parameter MSGFIL in the SYSOPT-CLASS2 parameter set and activating it when the monitor system is started:

```
MSGFILxx=<msg_filename>
MSGOFL=n
```

Here xx is the serial number (01..15) in the system parameter MSGFIL, and msg_filename the fully qualified name of the message file.
The number n of message files must also be incremented by one accordingly.

The message file can also be assigned as a message output file retroactively using the MODIFY-MIP-PARAMETERS command.

Assigning the syntax file

The syntax file of MAREN is entered in the SDF parameter file and activated by SDF when MAREN is installed with IMON.

The syntax file can also be activated by means of the MODIFY-SDF-PARAMETERS command or merged with the current BS2000 system syntax file.

Preparing the MAREN catalog

An already existing MAREN catalog can be continued to use with the new MAREN version.

If, e.g. after first installation, MAREN operation is to be started with a new, empty MAREN catalog, the following steps are to be executed:

- The MAREN delivery package contains an empty catalog file (`SYSDAT.MAREN.<ver>.CATALOG`). It contains a parameter record but does not contain catalog entries. This file must be cataloged as the file that is intended to be used for the future MAREN catalog, e.g. `$SYSMAREN.MAREN.CAT`.
- The MAREN catalog can be edited with the administrator program MARENADM. For example, free tapes could be added to the list of tapes available for reservation with the MARENADM statement ADD-FREE-VOLUMES.

  You must check free tapes to see if they need to be initialized so that they can be written to after being reserved. If the free tapes added need to be initialized, the INIT=*YES operand must be used in the MARENADM statement ADD-FREE-VOLUMES.
- In addition, the MARENADM statement ADD-RESERVED-VOLUME enables catalog entries to be generated for tapes which are assigned to a user ID but are not registered in the MAREN catalog. These may be created from the catalog entries of tape files in the TSOSCAT (VOLUME=*BY-TSOSCAT operand) or be taken from a SAM file with catalog entries in MAREN format (VOLUME=*ALL(INPUT-FILE=<file>) operand).
- If you want to add a large number of tape files in an incompatible format to the MAREN catalog, please contact a Competence Center or the Sales & Marketing Dept. of Fujitsu.

Starting the MAREN control programs MARENCP and, if required, MARENUCP

How to configure and start the MAREN control programs is described in the sections “MARENCP control program” on page 42 and “Automatic free volume allocation with MARENUCP” on page 50.

Setting MAREN parameters

Various parameters can be used to control how MAREN works. The following types of parameter exist:

- System-specific parameters
  These are set using the MARENADM statement EDIT-/MODIFY-MAREN-PARAMETERS or MODIFY-DOMAIN-ASSIGNMENT.

  When a system is added to the MAREN network the system-specific parameters are generated, see section “MAREN network” on page 103.
- Global parameters
  These are set using the MARENADM statement MODIFY-GLOBAL-PARAMETERS. With the exception of the access mode (ACCESS-MODE parameter), global parameters are only meaningful when domains are used.
- Domain-specific parameters
  These are set using the MARENADM statement MODIFY-DOMAIN-PARAMETERS. The domain-specific parameters are only meaningful when domains are used.

The MAREN administrator can have the settings of the MAREN parameters displayed using the MARENADM statements SHOW-...-PARAMETERS, and adjust these to the conditions in his/her system using the EDIT-/MODIFY-...-PARAMETERS statements.

Effectiveness of modifications to parameters

The parameter sets modified with the EDIT-/MODIFY-...-PARAMETERS statements are stored in the MAREN catalog.

The modifications become effective immediately on the MAREN administrator’s system because the parameter records are read with every MAREN or MARENADM statement. Each time MARENUCP is called, MAREN transfers the parameter records to MARENUCP. To accept new values, MARENUCP need only be terminated and restarted when the access mode is changed (ACCESS-MODE parameter).

In a MAREN network, modifications to parameters also become effective immediately. Each time a MAREN component accesses the MAREN catalog on a system of the MAREN network, the modified parameter records are read and accepted.

The tables below provide an overview of the parameters. The parameters and their effect are described in detail under the MODIFY-...-PARAMETERS statements.

System-specific parameters	Value range	Default setting	Description / Meaning
ALL-DOMAIN-ADMIN	ALLOWED / NOT-ALLOWED	NOT-ALLOWED	controls whether an ADA may work on the system
ARCHIVES-WORK-TIME	0..23:59	00000000	time the central archive is open
AUDIT	YES / NO / OPTIONAL	YES	controls the tape-specific checks
BATCH-EXEC-TIME	0..32767	100	batch task execution time
BATCH-REQUEST-TIME	0..32767	1800	batch task request time
CID-UID	YES / NO	NO	transfers catalog and user IDs to the catalog entry
DEFAULT-ADMIN-SCOPE	OWN-DOMAIN / ALL-DOMAIN	OWN-DOMAIN	administration scope when MARENADM is started
DEFAULT-DEVICE-TYPE	<name>	TAPE-C4	default device type for new reservations
DEFAULT-FREE-DATE	0..9999	7	default reservation period for tapes
DEFAULT-HOME-LOC	<name> / HOST	CENTRAL	default permanent location
DEFAULT-USER-ACCESS	OWNER-ONLY / FOREIGN-READ-ONLY / ALL-USERS	OWNER-ONLY	determines whether tapes are shareable by default
DEVICE-COMPLETION	YES / NO	YES	DEVICE parameter completion
DIALOG-EXEC-TIME	3..32767	50	dialog task execution time
DIALOG-REQUEST-TIME	3..32767	180	dialog task request time
EXPORT-ADDRESS-ACK	YES / NO	NO	mailing address confirmation
EXPORT-FOREIGN-TAPES	YES / NO	NO	export foreign tapes
EXPORT-PROCESSING	YES / NO	YES	export permission
EXPORT-RECEIPT	CONSOLE/ PRINTER / FILE / NO	NO	receipt output control
FOREIGN-TAPE-CHECK	YES / NO	YES	foreign tape check
FREE-POOLS	NO / GLOBAL / TSOS / <name>	empty	Free tape pool
HOST	<name>	empty	name of the local system
INPUT-FILE-CHECK	YES / NO	NO	input file name check
INPUT-TAPE-CHECK	YES / NO	YES	input tapes check
LOCATION-NAME	<name> / CENTRAL	CENTRAL	name of a location

(part 1 of 2)

System-specific parameters	Value range	Default setting	Description / Meaning
LOGGING	YES / NO	NO	definition of logging
MAREN-PASSWORD	<c-string> / <x-string> / <integer> / NONE / SECRET	NONE	MAREN password
MOUNT-CHECK-INTERVAL	<integer 9..9999>	60	wait time until a check is made to see whether a tape has been mounted
OPERATING-MODE	MANUAL / ROBAR-1 / ROBAR-2 / EXTERNAL	MANUAL	operating mode of a storage location
OPERATOR-ROLE	<name 1..8>	SYSMAREN	operator role which is required when MARENUCP runs or INITIALIZE-VOLUMES is called
OVERRULE-LOC	YES / REJECT	YES	Allows / rejects the use of a location other than the one specified in MARENLM
PRIVILEGED-USER-ID	<userid> / NONE	empty	user privilege assignment
RESERVATION-SEQUENCE	BY-VSN / BY-RESERVATION-COUNT / BY-LAST-ACCESS-DATE / BY-FREE-DATE	BY-VSN	the tapes which are to be reserved are selected in the order specified here
RESERVE-DEVICE-TYPES	<name>	TAPE-C4 / T6250	device types which are permissible for new reservations
RETPD-CHECK	YES / NO	YES	reservation period check
SHOW-INFORMATION	NORMAL / MAXIMUM	NORMAL	symbolic name of a location
SYMBOLIC-NAME	SAME / <name>	SAME	symbolic name of a location
TESTMODE	YES / NO	NO	switches test mode on/off
TSOS-PRIVILEGED	YES / NO	NO	TSOS privilege assignment
TYPE	REMOTE / LOCAL	LOCAL	Location ID

(part 2 of 2)

Global parameter	Value range	Default setting	Description / Meaning
ACCESS-MODE	SHARED / EXCLUSIVE	SHARED	mode of access to the MAREN catalog (shared or exclusive) [1]
ALL-DOMAIN-ADM-PASSW	<c-string> / <x-string> / <integer> / NONE / SECRET	NONE	password for the All-Domain Administrator
DOMAIN-PROTECTION	ACTIVE / NON-ACTIVE	NON-ACTIVE	controls whether domains are used

[1] See section “Selecting the mode” on page 49

Domain-specific parameters	Value range	Default setting	Description / Meaning
FREE-VOLUMES	FROM-OWN-DOMAIN / FROM-STD-DOMAIN	FROM-STD-DOMAIN	defines whether free tapes are taken from the user’s own domain or the standard domain.

Other adjustments

- If required, all users of the MAREN user program can be sent a message with the aid of the MAREN bulletin feature. The relevant text should be stored in the file defined during installation with IMON (see section “MAREN bulletin” on page 58).
- If the standard form implemented in MAREN is not to be used for export receipts, a customized layout for export receipts and return notes must be designed (see section “Export receipt” on page 60).
- If required, exit routines can be created and incorporated in a module library in order to modify certain MAREN activities see chapter “MAREN exits” on page 199.
- The encryption key administrator uses the MARENEKM (MAREN Encryption Key Manager, see chapter “MARENEKM administrator program” on page 493) administrator program for managing the encryption keys which enable the hardware feature “tape encryption” of LTO drives to be used in BS2000.

Security aspects

In cases where data security is the top priority, the following recommendations must be considered:

- Setting the system-specific MAREN parameters

```
FOREIGN-TAPE-CHECK = YES
INPUT-TAPE-CHECK   = YES
INPUT-FILE-CHECK   = YES
RETPD-CHECK        = YES
TSOS-PRIV          = NO
PRIVILEGED-USER-ID = *NONE
MAREN-PASSWORD     = YES
LOGGING            = YES
AUDIT              = YES
```

- The MAREN catalog must have the attribute USER-ACCESS=*OWNER-ONLY.
- The MAREN catalog and the logging files should be situated on different pubsets.
- To prevent archive numbers of the same name being mistaken for each other, there should be only one MAREN catalog in each data center.
- All the tapes of an archive system should belong to a single MAREN catalog.
- Before the MAREN subsystem is unloaded, the data center must take the necessary organizational steps to ensure that tape processing is no longer possible.

2.2.3 Configuration for multiple systems

Setting MAREN parameters

See “Setting MAREN parameters” on page 31.

Setting up a MAREN network

Multiple BS2000 systems on which MAREN is installed and configured can operate in a MAREN network with a central MAREN catalog. BS2000 systems support must configure and activate communications connections for a MAREN network. Detailed information on MAREN networks is provided in the section “MAREN network” on page 103.

Setting up domains

A MAREN network can be divided into groups of BS2000 systems, so-called domains. Detailed information on domains is provided in the section “Domains in a MAREN network” on page 106.

Setting up a locations

Tapes and tape devices can be grouped at so-called locations. Detailed information on locations is provided in the chapter “Managing locations” on page 117.

The location can be defined with a reservation file (see section “Location management via a reservation file” on page 126). The MAREN administrator creates and edits the reservation file using the MARENLM program (see section “Editing the reservation file with MARENLM” on page 134) or an editor.

2.2.4 Consistent tape management and processing

This section describes what has to be done or observed to ensure safe and consistent tape processing in conjunction with MAREN, HSMS/ARCHIVE, ROBAR, and BS2000 on the local system and the systems in the MAREN network.

The following requirements must be met to ensure consistent tape processing:

1. Data protection for the tapes:
   a) Protection against overwriting
   b) Protection against unauthorized export from the MAREN catalog
   c) Possibility of reconstruction after catalog loss
   d) Correction of inconsistencies in the catalog
2. Data privacy for the tapes:
   a) Unauthorized reading or export from the MAREN catalog
   b) Unauthorized reading of catalog entries
3. Consistent handling of reservation period:
   a) The reservation period must be consistently observed
   b) It must be possible to postpone the reservation period if necessary
   c) It must be possible to bring forward the reservation period if necessary
   d) It must be possible to release tapes prematurely
4. Consistency of various databases:
   a) MAREN: MAREN catalog
   b) HSMS: various archive directories
   c) ARCHIVE: various directories
   d) ROBAR: archive record
   e) BS2000: DEVICE-DEPOT table
5. Access to secure data must be possible at any time for authorized users.
6. When tapes are released prematurely, they must be reinitialized; otherwise, subsequent jobs could have problems with the tape labels.
7. The above requirements must also be met when using foreign tapes.

Information on and recommendations for effective compliance with the requirements above is provided below.
The number in brackets indicates a reference to the requirement with that number.

Notes on MAREN

1. The settings of the system-specific MAREN parameters on all systems in the MAREN network should be:
```
AUDIT              = YES    (1a),(2a),(2b),(3a)
FOREIGN-TAPE-CHECK = YES    (1a),(2a),(7)
INPUT-FILE-CHECK   = YES    (2a)
INPUT-TAPE-CHECK   = YES    (2a)
LOGGING            = YES    (1c),(1d)
MAREN-PASSWORD     = YES    (1c),(2b)
PRIVILEGED-USER-ID = NONE   (1a)
RETPD-CHECK        = YES    (1a),(3a)
TSOS-PRIVILEGED    = NO     (1a)
```
2. To prevent archive numbers of the same name being mistaken for each other, there should be only one MAREN catalog in each data center. You should also note that MAREN V12.5 only works with MAREN V102.0 and higher in a cluster.
`(1a),(2a),(3a),(7)`
3. When archive systems are used, all sets of tapes accessible to the archive system should belong to the same MAREN catalog.
`(1a),(2a),(3a),(4a),(4d),(7)`
4. The MAREN subsystem should not be unloaded during a BS2000 session. If, however, you do unload it, you must carry out organizational measures in the data center to ensure that tape processing is no longer possible.
`(1),(2),(3a),(4),(6)`
5. During MAREN release sessions, an INIT-FILE should always be created so that any necessary reinitializations can be carried out.
`(6)`
6. The MAREN catalog entry must have the attribute USER-ACCESS=*OWNER-ONLY.
`(2b)`
7. The MAREN catalog and the system-specific logging files should be on different pubsets for availability reasons.
`(1c)`
8. If you are using the SECOS software package, the `/SET-PRIVILEGE PRIVILEGE=TAPE-ADM, USER-ID=...` command must be used to allocate the user ID SYSMAREN and all user IDs with administration functions in MAREN. the system privilege of the same name (see the “SECOS” manual [21]).
`(2b)`

9. When importing exported tapes belonging to the local data center, the MAREN administrator must carry out special steps if it is suspected that the tape may have been overwritten in a remote data center. In these cases, the administrator must release the tape immediately after import so that it can be reinitialized.
   (4a),(4b),(4c),(6)

Notes on HSMS and ARCHIVE

1. Directory files must not be deleted until all archive numbers have been canceled using the HSMS statements MODIFY-ARCHIVE ...,SAVE-FILE=*DELETE and MODIFY-ARCHIVE VOLUMES=*REMOVE resp. the ARCHIVE statements PURGE and POOL.
   (4a),(4b)
2. If you rename a directory file, you must also change its name in the MAREN catalog for all affected tapes. MARENADM statement UPDATE-MAREN-CATALOG
   (4a),(4b)
3. When data is saved, the specifications for RETPD and SHARE are automatically copied to the MAREN catalog via the ARCHIVE-MAREN link. No special steps have to be taken. The specification SHARE=YES is converted to USER-ACCESS=*FOREIGN-READ-ONLY.
   (3a),(4a),(4b)
4. The reservation period for backup files can be extended in HSMS (HSMS statement MODIFY-ARCHIVE). The expiration date is updated accordingly in the MAREN catalog through a MAREN interface.
   This is possible also with MAREN (see page 41), but it is not recommended due to the inconsistencies of the reservation periods maintained by MAREN and HSMS.
   (3b)

   There are no functions for postponing and bringing forward the reservation period in ARCHIVE. This is possible only with MAREN (see page 41).
   (3b),(3c)
5. When incomplete saved data versions are released prematurely with the HSMS statement MODIFY-ARCHIVE ...,SAVE-FILES=DELETE(...,FORCED-DELETE=YES) or the ARCHIVE statement PURGE ...,FORCE=YES, the interworking of HSMS/ARCHIVE and MAREN automatically ensures that the reservation period are handled consistently, and that the tape cannot be reserved again until it has been reinitialized.
   (3d),(4a),(4b),(6)
6. When creating free tape pools for HSMS/ARCHIVE in the MAREN catalog, the administrator must make sure that all the tapes of a pool have the same location. Otherwise, there may be problems when devices are reserved by the BS2000 device management.
   (5)

7. Recommendation: No AVAILABLE tapes should be added to the directories (using the HSMS statement `MODIFY-ARCHIVE ..,VOLUMES= *ADD` or the ARCHIVE statement POOL ADD). All output tapes should be assigned through the automatic free tape allocation of MAREN. This means that all tapes in the directories have the INQUIRE attribute OWNER=OPERATOR. The advantage of this is that free tapes are used more efficiently.

Notes on ROBAR

1. Tapes from a remote data center should not be deposited in the foreign cartridge area of the input/output unit, but quite officially be accommodated in the area of the storage locations.
   `(1a),(2a),(4a),(4d),(7)`
2. When exporting tapes from the archive system, you should use the MARENADM statement EXPORT-VOLUME or RETURN-VOLUMES instead of the ROBAR statement EXPORT-ROBAR-VOLUME. Only then can proper MAREN-ROBAR interaction be guaranteed.
   `(4a),(4d)`
3. There are also commands at archive system level for importing and exporting tapes to and from the archive system. However, you should not use these, as interaction with the MAREN cannot be guaranteed.
   `(4a),(4d),(7)`

Postponing reservation period

The file expiration date in the MAREN catalog can be extended by any length of time using the following MARENADM statement:
`//MODIFY-VOLUME-ATTR VOL=<vsn>,EXPIRATION-DATE=<date>,FILE-SEQ=2`

If necessary, the expiration date FREE-DATE is also extended at the same time. MAREN then prevents any DVS write attempts until the specified release date is reached.

Postponing the reservation period with MAREN should be avoided for HSMS/ARCHIVE backups. When PURGE is performed by HSMS/ARCHIVE, the tapes would be released by any means. It is therefore recommended to postpone the reservation period of HSMS backup files by means of HSMS statement `MODIFY-ARCHIVE ...,SAVE-FILE=*RETENTION-PERIOD (RETPD-EXTENSION=...)`.

Since the reservation period entered on the HDR1 label is, of course, not modified, the postponed logical reservation period applies only to systems in the MAREN network. These tapes must therefore not be exported, since they themselves are not protected.

Bringing forward reservation period

The file expiration date and the tape expiration date in the MAREN catalog can be reduced by any length of time using the following statement:
`//MODIFY-VOL-ATTR VOL=<vsn>,EXPIR-DATE=<date>,FREE-DATE=<date>,FILE-SEQ=2`

If the specified file expiration date is lower than the tape expiration date, the INIT=YES will be set.

2.3 MARENCP control program

To access the MAREN catalog, on each system of the MAREN network MAREN requires a task executing permanently in the background which the MARENCP control program has loaded.

The sections below describe working with the MARENCP control program without taking domains into consideration. What you need to bear in mind in addition when using domains is explained in the chapter “MAREN network and domains” on page 106.

2.3.1 Start files for MARENCP

MARENCP is started using an ENTER file or procedure. For this purpose, several start files (ENTER and procedure files) are supplied with MAREN. These differ in structure depending on their purpose, and may have to be adapted to adapted to suit local conditions:

ENTER files for MARENCP

Two ENTER files are supplied as samples for MAREN operation in exclusive or shared mode (see section “Operating modes in MAREN” on page 47):

- SYSENT.MAREN.<ver>.EXCL.MARENCP
- SYSENT.MAREN.<ver>.SHAR.MARENCP

A separate ENTER file is required for each system in the MAREN network. Each ENTER file must be adapted to conditions in the data center.

Notes on shared mode

When access is to take place from remote systems in the MAREN network to the central MAREN catalog with RFA, the connection to the partner system must be set up using the SET-RFA-CONNECTION command before the MAREN catalog file is assigned. Since this involves simultaneous access to the MAREN catalog by several systems, the catalog files should be opened in shared update mode (see the operand SHARED-UPDATE=*YES in the ADD command). The logging file should always be located on the local system.

In MAREN shared mode, it is possible that connection setup to the system with the MAREN catalog will not always work immediately when the MARENCP task is started on a remote system. A sufficiently long time period should therefore be specified for the TIME operand in the SET-RFA-CONNECTION command, within which the MARENCP task on the remote system will attempt to set up a connection. If the TIME operand is set too low, the MARENCP task on the RFA remote system will terminate prematurely without a connection being established.

If MARENCP on a remote system receives a DMS error code when accessing the MAREN catalog indicating a failure of the RFA connection to the system with the MAREN catalog, MARENCP sets task switch 28 and terminates. This switch should be queried in the MARENCP ENTER file for shared mode. If it was set by MARENCP, the connection should be cleared using REM-RFA-CONNECTION and attempts made at regular intervals to open a connection to the system with the MAREN catalog using SET-RFA-CONNECTION.

The command format of the ENTER files should be identical on all systems, so that major modifications to the start procedures do not have to be undertaken when transferring the MAREN catalog. For this reason, the ENTER file on the system with the MAREN catalog should also include a SET-RFA-CONNECTION command.

Assigning files

In all start files, the addressed files of the MAREN catalog must be assigned with link names before MARENCP is called. The names of the catalog files and their user IDs are freely selectable here. It is recommended that these files be kept under the execution ID of the MARENCP task (SYSMAREN). The following link names are expected:

MARENCAT for the volume catalog

MARENLOG for the logging file

MARENLMF for the reservation file

MARENLIB For a module library with the MAREN exits (Allocation of the MAREN module library is required only if exit routines are to be activated.)

Offline logging

If no volume catalog is assigned (e.g. because there are none available), MARENCP activates offline logging. In other words, only logging records are written. As soon as the volume catalog becomes available again, the logging records can be “merged” using the MARENADM statement UPDATE-MAREN-CATALOG.

Since the protection attributes of the tapes cannot be evaluated without accessing the volume catalog, the operator is responsible for permitting or rejecting tape requests.

2.3.2 Starting and terminating of MARENCP

The MARENCP control program must execute under the user ID SYSMAREN or another user ID with the TAPE-ADMINISTRATION privilege.

The MAREN subsystem cannot be activated until after the MARENCP task has been started during a BS2000 session. **Prior** to this, all interactive tasks involving tape processing are rejected, and all batch tasks wait for input from the operator. Therefore, when starting up a system, suitable start procedures must be used to ensure that the MAREN control program and the MAREN subsystem are activated.

In order to test MARENCP, you can use the system-specific MAREN parameter TEST-MODE to run the program in test mode. After the test phase has concluded, test mode must once again be disabled, see the MARENADM statement MODIFY-MAREN-PARAMETERS.

Starting MARENCP

The MARENCP control program is started by issuing the START-MARENCP command. MARENCP can also be called using START-PROGRAM command for compatibility reasons.

START-MARENCP	Alias: **MARENCP**
VERSION = ***STD** / <product-version mandatory-man-corr> / <product-version mandatory-man-without-corr> / <product-version without-man-corr>	
,**MONJV** = ***NONE** / <filename 1..54 without-gen-vers>	
,**CPU-LIM**IT = ***JOB-REST** / <integer 1..32767>	

VERSION =
The selected MARENCP version is used.

VERSION = *STD
Before MARENCP is called, the version is set by means of the SELECT-PRODUCT-VERSION command (in system mode). This set version is used as the default version.

VERSION = <product-version mandatory-man-corr>
Full version identifier.

VERSION = <product-version mandatory-man-without-corr>
Version identifier excluding the correction status.

VERSION = <product-version without-man-corr>
Version identifier excluding the release and correction status.

MONJV =
Specification of a job variable for monitoring the MARENCP run.

MONJV = *NONE
A monitor job variable is not used.

MONJV = <filename 1..54 without-gen-vers>
Explicit specification of the job variable for monitoring the MARENCP run.

CPU-LIMIT =
Maximum CPU time in seconds allocated for the program.

CPU-LIMIT = *JOB-REST
The remaining CPU time is to be used for the job.

CPU-LIMIT = <integer 1..32767 seconds>
Only the specified time is to be used.

Terminating MARENCP

MARENCP is terminated properly with the MARENADM statement STOP-CONTROL-PROGRAM. All open files of the MAREN catalog are closed.

In the event of severe errors, the control program terminates with a dump. The spin off is triggered in a procedure or ENTER file.

If the errors that lead to termination of the MARENCP run are easy to diagnose and therefore do not require a dump, they are simply logged by MARENCP. Appropriate messages are issued to SYSOUT and/or console and task switch 29 is set.

2.3.3 Execution of MARENCP

To prevent MARENCP from being loaded more than once on the same system, a file with the link name MARENLCK is opened in OUTPUT mode at the beginning of the control program. By default, the name of this file is `$SYSMAREN.MAREN.LOCK.FILE`. However, this file name is freely selectable (see section “Installation with IMON” on page 23). Restart of the control program is not possible until this file has been closed when the MARENCP task is terminated.

MAREN checks in the MAREN catalog whether a suitable MAREN version for cooperation exists on all systems in the MAREN network. If this is not the case, MARENCP terminates and reports the system concerned on the console and on SYSOUT.

The control program changes the task attribute of the MARENCP task to TP in order to enhance performance, provided the job class definition or the user entry permits this.

If the system-specific parameter LOGGING is used to enable logging and no logging file is allocated, then MARENCP creates a logging file with a default name and opens this in shared update mode. This default name is:
`$SYSMAREN.MAREN.LOGGING.yyyymmdd.hhmmss.<hostname>`.

Meaning:

`yyyymmdd`	Current date (ISO4 format);
`hhmmss`	Time
`<hostname>`	Name of the local system

If an empty logging file is assigned, it is created anew in OPEN mode OUTIN. Otherwise, writing continues to this file in OPEN mode INOUT.

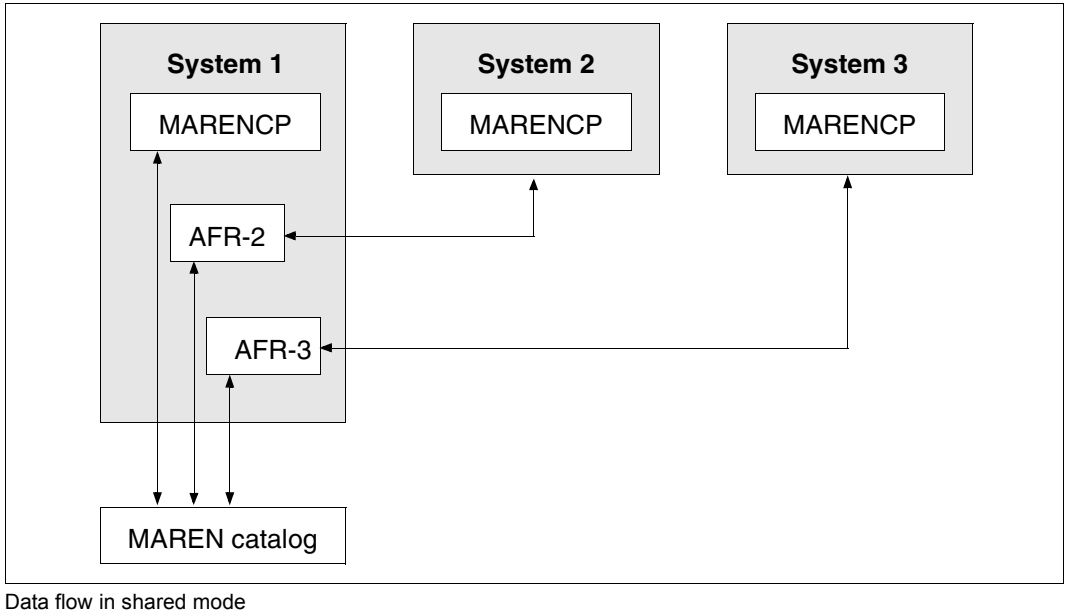
2.3.4 Operating modes in MAREN

MAREN offers the operating modes “shared mode” and “exclusive mode” which differ in the access method to the MAREN catalog used by the systems involved or the MARENCP control program.

See also the section “Backup of the MAREN catalog” on page 69.

Shared mode (default, previously also called RFA mode)

In shared mode, the BS2000 component RFA is used for the transfer of data between the attached systems and the MAREN catalog. The data flow takes place as follows:



Data flow in shared mode

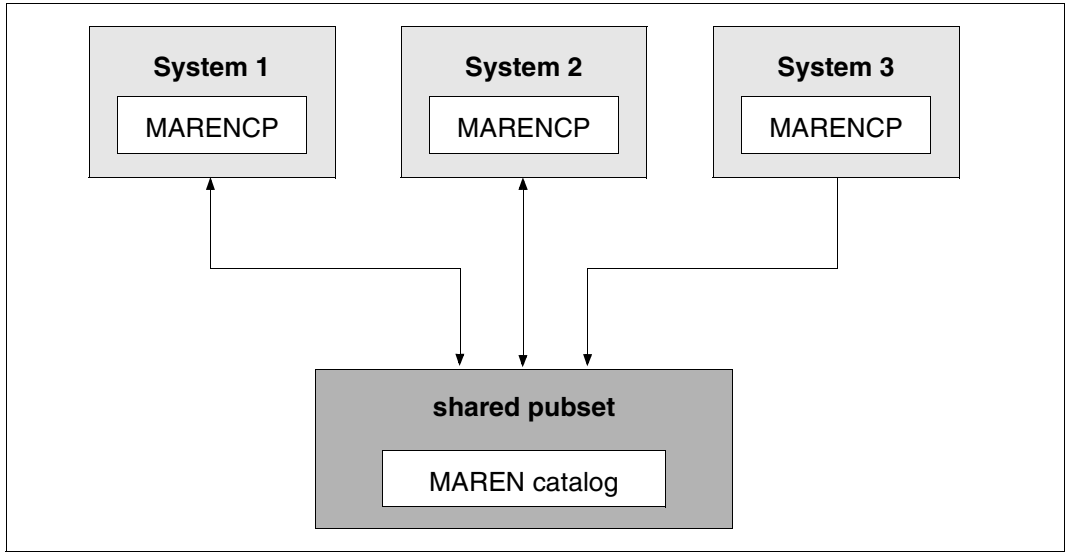
The MAREN catalog can reside on a pubset or private disk. For availability reasons, the home pubset is **not** recommended for the MAREN catalog. The DMS ISAM accesses to the MAREN catalog take place in shared update mode, i.e. Locks are implemented only at record level, not at file level.

The software product RFA is required (see the “RFA” manual [18]).

Exclusive mode

In exclusive mode, each of the systems involved in the MAREN network has access to the disk with the MAREN catalog, see chapter “MAREN network and domains” on page 101. The software product HIPLEX MSCF is required (see the “HIPLEX MSCF” manual [12]).

The data flow takes place as follows:



Data flow in exclusive mode

ISAM access to the MAREN catalog need not take place in shared update mode, since only one task from each system can open the MAREN catalog.
However, each attempt to access the catalog must be preceded by an internal OPEN and followed by an internal CLOSE, so that access by other system is not blocked. In other words locks are implemented at file level.

Selecting the mode

The mode is set using the global MAREN parameter ACCESS-MODE=*SHARED/ *EXCLUSIVE. Shared mode is set by default.

The global parameter ACCESS-MODE can only be modified without problems by means of the following actions:

1. Termination of MARENUCP on all systems
2. Termination of MARENCP on all systems except the local system
3. Modification of the parameter using `//MODIFY-GLOBAL-PARAMETERS ACCESS-MODE=...`
4. Termination of MARENCP on the local system
5. Starting MARENCP and MARENUCP on all systems

The modes differ in MAREN by the time during which the MAREN catalog is opened:

- In shared mode, the MAREN catalog is permanently opened for I/O operations.
- In exclusive mode, the MAREN catalog is always closed in the intervals between individual accesses to the catalog. The catalog is re-opened with each new access.

As a result of these different approaches, the following should be noted when selecting the mode:

- In shared mode, the performance of the RFA has a direct effect on MAREN performance.
- The exclusive mode is useful only if there are relatively few accesses to the MAREN catalog, both implicitly via the tape processing facility and explicitly via the MAREN and MARENADM programs. Frequent attempts to access the MAREN catalog in exclusive mode lead to poorer performance.
- In exclusive mode, only a few files or seldom used files should be located on the disk in addition to the MAREN catalog.

2.4 Automatic free volume allocation with MARENUCP

The MAREN component MARENUCP automates the allocation of free tapes.

If a tape is requested without specifying an archive number (scratch request), MARENUCP takes over the tasks of the operator. MARENUCP finds a free tape in the MAREN catalog, reserves it for the user, and ensures that the tape is readied for processing.

2.4.1 Start file for MARENUCP

MARENUCP is started using the ENTER file below, which is included in the MAREN delivery package. If necessary, it must be adapted to conditions in the data center.

```
/SET-LOGON-PARAMETERS USER-ID=TSOS, ACCOUNT=*NONE, JOB-NAME=MARENUCP
/MOD-TEST DUMP=YES
/REMARK * ASSIGNMENT OF THE EXIT LIBRARY (OPTIONAL) *
/SET-FILE-LINK LINK=MARENLIB,F-NAME=$SYSMAREN.MARENLIB
/START-MARENUCP
END
/SKIP-COMMAND TO-LABEL=NOSPOOL,IF=JOB-SW(OFF=29)
/EXIT-JOB MODE=NORMAL
/.NOSPOOL EXIT-JOB MODE=NORMAL,SYSTEM-OUTPUT=NONE
```

MARENUCP is executed under a user ID which has been assigned the TAPE-ADMINISTRATION privilege and the operator role which was allocated in the system-specific MAREN parameters (default: SYSMAREN).

2.4.2 Starting and terminating of MARENUCP

The following preparations must be made before staring MARENUCP:

- Define the mandatory and optional parameters

  Using the MARENADM statement EDIT-/MODIFY-MAREN-PARAMETERS, the following mandatory or optional system-specific parameters must be defined which are also or exclusively evaluated by MARENUCP:
  - CID-UID
  - DEFAULT-FREE-DATE
  - DEFAULT-HOME-LOCATION
  - MOUNT-CHECK-INTERVAL
  - OPERATOR-ROLE
  - RESERVATION-SEQUENCE
  - RESERVE-DEVICE-TYPES
  - TEST-MODE

  These parameters may be changed during operation. The changes come into effect immediately.

- Use of a reservation file

  A reservation file to be used must be assigned with the link name MARENLMF before calling MARENUCP (see section “Location management via a reservation file” on page 126).

- Using a MAREN exit

  If an exit routine is to be used, the corresponding module library must be assigned with the link name MARENLIB before calling MARENUCP (see chapter “MAREN exits” on page 199). The exit routine is called after any assigned reservation files have been evaluated.

Starting MARENUCP

MARENUCP can be started after BS2000 and BCAM are ready to operate.

MARENUCP is called by means of the START-MARENUCP command. MARENUCP can also be called by means of the START-PROGRAM command for compatibility reasons.

START-MARENUCP	Alias: **MARENUCP**
VERSION = ***STD** / <product-version mandatory-man-corr> / <product-version mandatory-man-without-corr> / <product-version without-man-corr>	
,**MONJV** = ***NONE** / <filename 1..54 without-gen-vers>	
,**CPU-LIM**IT = ***JOB-REST** / <integer 1..32767>	

VERSION =
The selected MARENUCP version is used.

VERSION = *STD
Before MARENUCP is called, the version is set by means of the SELECT-PRODUCT-VERSION command (in system mode). This set version is used as the default version.

VERSION = <product-version mandatory-man-corr>
Full version identifier.

VERSION = <product-version mandatory-man-without-corr>
Version identifier excluding the correction status.

VERSION = <product-version without-man-corr>
Version identifier excluding the release and correction status.

MONJV =
Specification of a job variable for monitoring the MARENUCP run.

MONJV = *NONE
A monitor job variable is not used.

MONJV = <filename 1..54 without-gen-vers>
Explicit specification of the job variable used to monitor the MARENUCP run.

CPU-LIMIT =
Maximum CPU time in seconds allocated for the program.

CPU-LIMIT = *JOB-REST
The remaining CPU time is to be used for the job.

CPU-LIMIT = <integer 1..32767 seconds>
Only the specified time is to be used.

Terminating MARENUCP

MARENUCP is terminated by means of the MARENADM statement
`//STOP-CONTROL-PROGRAM PROGRAM-NAME=MARENUCP`

Alternatively, it can be terminated with the command (TSOS or OPERATING privilege):
`/INFORM-PROGRAM MSG=C'H[ALT][,KILL]',JOB-ID=*TSN(<tsn>)`

If `HALT` is specified, MARENUCP usually ends immediately. If, however, a tape has already been reserved in response to a request, processing of this request is completed, after which MARENUCP is terminated. Further requests are not processed.
If `HALT,KILL` is specified, MARENUCP ends immediately.

If the errors that lead to termination of the MARENUCP run are easy to diagnose and therefore do not require a dump, they are simply logged by MARENUCP. Appropriate messages are issued to SYSOUT and/or console and task switch 29 is set.

2.4.3 Execution of MARENUCP

MARENUCP is a permanent batch task running under a user ID which has been configured with the TAPE-ADMINISTRATION privilege and the operator role which is entered in the system-specific MAREN parameters. MARENUCP establishes a connection to UCON. No authorization name is required for connection setup. It reads all messages referring to tape processing through the UCON interface.

A request for an free tape triggers the following steps in MARENUCP:

- Determination of the tapes mounted on the devices.
- A mounted, free tape is determined and reserved in the MAREN catalog. A reservation file or a MAREN exit is taken into consideration here.
- If no free mounted tape is found, then the operator is requested to mount one. It is not necessary to respond to the prompt, because MARENUCP will detect when the tape is mounted.

VSN proposal

In the event of a corresponding request, MARENUCP requests the operator to mount a free tape: `MOUNT TAPE <vsn>,...`

The operator can mount the proposed tape or a different free tape, which is then automatically allocated.
If a free tape is already mounted, this is allocated without a request being issued to the operator.

The sequence in which tapes are proposed is defined automatically on the basis of how frequently they are utilized. Tapes that are used less frequently are proposed first.

The criterion used to measure the frequency with which a volume is used is defined with the system-specific MAREN parameter RESERVATION-SEQUENCE.
The possible selection criteria are VSN, RESERVATION-COUNT, LAST-ACCESS-DATE and FREE-DATE.

2.4.4 Information on automatic free tape allocation

When allocating a free tape, the catalog entry fields listed in the table below are set: All other catalog entry fields are set immediately after the free tape is assigned during OPEN processing.

Catalog entry field	Catalog entry field values subsequent to allocation
USER-IDENTIFICATION ACCOUNT CREATION-JOB-NAME	The user ID, account number, and job name are taken from the user's SET-LOGON-PARAMETERS command. In the case of HSMS tasks, the user ID of the HSMS directory and the first account number of the user entry are used. In the case of SPOOL output, the account number is filled with blanks.
FILE-NAME or DIRECTORY-NAME	The file name or directory name specified by the user is used.
USER-ACCESS	As set by the MAREN administrator.
RESERVATION-DATE	Current date.
FREE-DATE	The release date is determined from the value set by the MAREN administrator for DEFAULT-FREE-DATE.
DEVICE-TYPE	The value set by the MAREN administrator for DEFAULT-DEVICE-TYPE is used as the device type.
HOME-LOCATION	The value set by the MAREN administrator for DEFAULT-HOME-LOCATION is used.

Notes for the operator

- The prompt `MOUNT TAPE <vsn>` is output as messages which must be acknowledged under the user's TSN.
  You can use the SHOW-PENDING-MSG command to output any messages that have not yet been acknowledged. Messages can be rejected with `tsn.N`.
- The assignment of free tapes on real drives is accelerated if MARENUCP finds free tapes on the tape devices. It consequently makes sense to mount free tapes on free real tape devices as a precautionary measure. In an archive system, this task is performed by the archive controller.
  The provision of free tapes which are to be mounted in advance or as a result of a MARENUCP request can be handled by means of the MARENADM statement SECURE-FREE-VOLUME ...,USAGE=*BY-MARENUCP. This ensures that these tapes will be available to MARENUCP alone and cannot be explicitly reserved by users by means of the MAREN statement RESERVE-FREE-VOLUME.

  The MARENADM statement SHOW-FREE-VOLUMES USAGE=*BY-MARENUCP can be used to display the tapes which have been readied.

- A prerequisite for the automatic tape allocation facility is that the mount parameters for tapes include the operand ALLOCATE-TAPE=*YES (see the MODIFY-MOUNT-PARAMETER command). Otherwise, the user will have to acknowledge PREMOUNT messages for tapes that have already been mounted. The current settings for the mount parameters can be queried using the SHOW-MOUNT-PARAMETER command.

Notes for the MAREN administrator

- Free tapes to be assigned by the automatic free tape allocation facility must contain standard labels and must not be protected. The tapes have to be initialized before they can be used (again).

  This is achieved during MAREN operation either by specifying an output file (INIT-FILE) in the MARENADM statement FREE-VOLUMES when releasing reserved tapes and processing this file, or by means of the function for automatically initializing magnetic tapes (see page 57).
  For tapes which are newly added to the MAREN, the MAREN administrator must ensure that these conditions are satisfied.

- If the cataog entries of tapes already mounted in tape devices are modified, any changes made generally do not come into effect for MARENUCP until the message `NKVT011` is output after dismounting

Special situations

When errors occur in MAREN, MARENUCP terminates and issues error messages to this effect. In most cases, the other components of MAREN will also be affected. MARENUCP must be restarted after the error, whereupon it processes all open requests.

Changes to the input/output configuration implemented by means of dynamic reconfiguration are not detected automatically by the active MARENUCP task. To ensure that these changes come into effect, you must terminate and restart MARENUCP. This applies in particular if automatic initialization is used and new devices or device types have been added to the configuration dynamically.

Free tape allocation with FDDRL

See section “Allocation of free tapes” on page 181.

2.4.5 Automatic initialization of tapes

There is another way of initializing tapes, beside the INITIALIZE-VOLUMES command, if a tape needs to be initialized before it is reserved again.

For this purpose, the FREE-VOLUMES command has to be issued with the operand INIT-FILE=*NONE. This allows tapes to be released which have still to be initialized.

If such a tape is later mounted for reservation by MARENUCP, MARENUCP carries out initialization.

The operator only needs to intervene if the tape cannot be allocated automatically. For example because the tape is in a device that is busy, in particular, if it is not mounted on the proposed device. In that case the message `NKVT013` is issued: The operator has to respond with `<tsn>.<mn>`.

Restrictions

An automatic initialization cannot be performed in the following cases:

- The reservation is made with the RESERVE-FREE-VOLUME command from MAREN or MARENADM.
- If tapes are requested with the CREATE-FILE or CREATE-FILE-GENERATION command and the operand VOLUME=*ANY(NUMBER-OF-DEVICES=n), only the first tape can be initialized if n>1.

In these cases the volumes are reserved. Problems may occur when a new owner accesses a volume for the first time if the tape labels still contain a reservation period that has not expired or the user ID of a foreign owner. In this case, initialization must be performed manually by the operator.

2.5 MAREN bulletin

Similarly to the LOGON bulletin in BS2000, a file containing information for the MAREN user can be set up by the MAREN administrator. The messages deposited there are automatically output after the MAREN user program has been called.

The bulletin file can be created in SAM file format using any editor. It must be shareable (USER-ACCESS=*ALL-USERS) and protected against inadvertent overwriting (ACCESS=*READ). A message can consist of multiple records.

The BULLETIN file must be constructed in such a way as to allow the interactive user to request further follow-up messages step by step following the first message. In each case, the following query is issued before further messages are output:
`CONTINUE OUTPUT OF BULLETIN? REPLY (Y=YES; N=NO)`

In the case of batch jobs, this possibility of optional output does not exist; merely the first message block of the BULLETIN file is output to SYSOUT. For this reason, the most recent messages should always be placed at the beginning of the BULLETIN file.
Apart from messages addressed to all MAREN users, special information can also be provided for defined users. The following message offers this option to the interactive user.
`CONTINUE OUTPUT OF BULLETIN FOR USERID (&OO)? (Y=YES; N=NO)`

In batch tasks, this special message is output via the SPOOLOUT log. With regard to this option, it is good practice to structure the file in three parts, as follows:

1. General information for all users. Follow-up messages begin with a data record containing a STOP statement:
   `**STOP**`
2. Special information for defined users. (Grouping of messages for a particular user is not necessary). This information begins with a data record containing a STOP statement for the defined user:
   `**STOP** <userid>`
3. Additional information which can be queried for all users. Follow-up messages begin with a data record containing a STOP statement:
   `**STOP**`

The STOP statement separates the individual groups of messages. At this point, the user specified in the STOP statement is asked whether bulletin output is to be continued.

Example

The BULLETIN file was created with the following contents (displayed with the command SHOW-FILE):

```
   ********************************************************************
   ********************************************************************
   *  Normal MAREN operation from 07:00 to 19:00                      *
   *  To contact the administrator, dial 77889                        *
   *                                                                  *
   ********************************************************************
**STOP** USER1
   *                                                                  *
   *  This is a message for USER1: ...........................        *
   *  .....................................................           *
   *                                                                  *
   ********************************************************************
**STOP** USER2
   *                                                                  *
   *  This is a message for USER2: ...........................        *
   *  .....................................................           *
   *                                                                  *
   ********************************************************************
**STOP** USER1
   *  This is another message for USER1: ..........                   *
   *  .....................................................           *
   *                                                                  *
   ********************************************************************
e                                                          S*SOF+     1(     1)
```

The following command should then be issued:
`/MODIFY-FILE-ATTRIBUTES MAREN.BULLETIN, USER-ACCESS=*ALL-USERS, ACCESS=*READ`

After MAREN is started, USER1 receives the following output:

```
/start-maren
   ********************************************************************
   ********************************************************************
   *  Normal MAREN operation from 07:00 to 19:00                      *
   *  To contact the administrator, dial 77889                        *
   *                                                                  *
   ********************************************************************
%  MARM1B2 CONTINUE OUTPUT OF BULLETIN FOR USERID 'USER1'? REPLY (Y=
YES; N=NO)?y
   *                                                                  *
   *  This is a message for USER1: ...........................        *
   *  .....................................................           *
   *                                                                  *
   ********************************************************************
%  MARM1B2 CONTINUE OUTPUT OF BULLETIN FOR USERID 'USER1'? REPLY (Y=
YES; N=NO)?y
   *  This is another message for USER1: ..........                   *
   *  .....................................................           *
   *                                                                  *
   ********************************************************************
%//
```

2.6 Export receipt

An export receipt can be generated for the EXPORT-VOLUME statement, written to a file, and printed out.

The layout of the export receipt can be freely defined by the MAREN administrator depending on current requirements.

Defining working procedures

The following MARENADM statement must be issued if export receipts are to be output to a printer:

```
//MODIFY-MAREN-PARAMETERS
     EXPORT-RECEIPT=*PRINTER(DEVICE-NAME=..,FORM-NAME=...)
```

The individual settings of the MAREN parameter EXPORT-RECEIPT are described in more detail in the description of the MODIFY-MAREN-PARAMETERS statement.

Before it is printed, each export receipt is stored temporarily in the `$<userid>.MAREN.EXPORT-RECEIPT.<vsn>` file. Further details can be found in the notes in the description of the EXPORT-VOLUME statement.

The transport lists generated by the MARENADM statements RETURN-VOLUMES and SECURE-FREE-VOLUMES can also be output to the specified printer if required. Further details can be found in the notes on the two statements.

2.6.1 Standard layout

If no customized layout exists, the export receipts are created using MAREN's standard layout. The figure on the next page shows an example of an export receipt in the standard layout:

```
A  +-------------------------------------------------------------------+
   |                                                                   |
   |                                                                   |
   |      M      M      AA      RRRRRR     EEEEEEEE   N     NN        |
   |      MM    MM     AAAA     RR   RR    EEEEEEEE   NN    NN        |
   |      MMM  MMM    AA  AA    RR    RR   EE         NNN   NN        |
   |      M MMM M   AA    AA   RR   RR    EE         NNNN  NN        |
   |      MM MM MM  AA    AA   RRRRRR     EEEEEEE    NN NN NN        |
   |      MM    MM  AA    AA   RR RR      EEEEEEE    NN NN NN        |
   |      MM    MM  AAAAAAAA   RR  RR     EE         NN  NNNN        |
   |      MM    MM  AA    AA   RR   RR    EE         NN   NNN        |
   |      MM    MM  AA    AA   RR    RR   EEEEEEEE   NN    NN        |
   |      MM    MM  AA    AA   RR     R   EEEEEEEE   NN     N        |
   |                                                                   |
   |                                                                   |
   +-------------------------------------------------------------------+
   |                                                                   |
   |          M A R E N    E X P O R T   R E C E I P T                 |
   |                                                                   |
   +-------------------------------------------------------------------+
   |          +----------+                                             |
   |  VOLUME: |  SY1701  |         (LAST-TEMP-LOCATION: MANUAL  )      |
   |          +----------+                                             |
   |                                                                   |
   |                                                                   |
   |  EXPORT-AD: MRSY0017 - EXPORT TEST                                |
   |                                                                   |
   |                                                DATE: <date>       |
   |                                                TIME: <time>       |
   |  SIGNATURE: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _                       |
   |                                                                   |
   +-------------------------------------------------------------------+
   |  ORDERED BY: USER-ID : MAREN001                                   |
   |              ACCOUNT : MAREN                                      |
   |              JOB-NAME: TEST00X1                                   |
   |              HOST    : D051ZE19                                   |
   |              TSN     : 4KWW                                       |
   +-------------------------------------------------------------------+
   |MAREN CATALOG ENTRY:                                               |
   |                                                                   |
   |VOLUME    =SY1701       FILE-SEQ=0001      DEV-TYPE   =TAPE-V1     |
   |                                                                   |
   |USER-ID   =MAREN001     HOME-LOC=MANUAL    RESERV-DATE=<date>      |
   |ACCOUNT   =MAREN001     FREE-LOC=MANUAL    FREE-DATE=<date>        |
   |USER-ACC  =ALL-USERS    TEMP-LOC=MANUAL    EXPORT-DATE=<date>      |
   |PASSWORD  =YES                                                     |
   |REMARK    =                                                        |
   |EXPORT-AD =MRSY0017 - EXPORT TEST                                  |
   |USER-FIELD=                                                        |
   |FILE-NAME =MRSY0017.001.DMSFILE.1                                  |
   |DIR-NAME  =                                                        |
   |ARCH-USAGE=*NO                                                     |
   |OPEN-MODE =OUTPUT     CR-DATE     =<date>    LA-A-DATE  =<date>    |
   |DEV-NAME  =MN         CR-TIME     =<time>    LA-A-TIME  =<time>    |
   |VOL-SEQ   =0001       CR-CAT-ID   =TDQA      LA-A-USER  =MAREN001  |
   |FIRST-VOL =SY1701     CR-USER-ID  =MAREN001  LA-A-ACC   =MAREN     |
   |CLOSE-IND =CLOSED     CR-JOB-NAME =MAREN001  LA-A-JOB-N =MAREN001  |
   |EXPIR-DATE=<date>     LAST-CL-DATE=<date>    LA-A-TSN   =          |
   |AUDIT     =NO         LAST-CL-TIME=<time>    LA-A-SNO   =087       |
   |VOL-STATUS=RESERVED   RESERV-COUNT=0001      LA-A-HOST  =D241ZE49  |
   |INIT      =YES        ACCESS-COUNT=00000003  LA-A-FUNC-N=GET       |
   |ADM-FIELD =$$$$$$$$   CHECK-COUNT =07        LA-A-FUNC-F=23        |
   |                                                                   |
   +-------------------------------------------------------------------+
```

2.6.2 Customized layout

The standard layout offered by MAREN can be modified, or even be completely redesigned from scratch. A customized layout must be stored in a file. This file name can be freely selected (see also "Dummy release items" on page 24). The file must possess the following attributes:

```
ACCESS-METHOD=SAM,RECORD-FORMAT=V,USER-ACCESS=ALL-USERS,ACCESS=READ
```

In a network, the file must, when necessary, be available on every system, although layouts can be different. The standard layout is used on all systems where this file is not available.

There are no restrictions on the characters used in the layout file, i.e. special characters and non-printable characters are supported. The MAREN administrator is entirely responsible for how the export receipt is actually output on the printer.
There is no limit on the number of records. The individual records can contain up to 141 characters (including the record length field).

So-called layout variables are defined to allow the export receipts to be provided with current values. They are 7 or 8 characters long and all begin with the character '&'. MAREN searches the layout file for these variables. Each record of the layout file can contain any number of variables at any position. This is limited only by the maximum length of the record.

Variables can be used more than once. When an export receipt is generated, the layout file is read record by record, all variables are replaced by current values, and all the records are written to the output file.

Name	Length	Meaning
&ACCNT8*	8	ACCESS-COUNT
&ACCOUNT	8	ACCOUNT
&ADMFIEL	8	ADMINISTRATOR-FIELD
&ADMFI2*	16	ADMINISTRATOR-FIELD-2
&ARCHUSA	54	FREE-POOL
&AUDITV*	3	AUDIT
&CHECNT*	2	CHECK-COUNT
&CLOSEI*	6	CLOSE-INDICATOR
&CRECAT*	4	CREATION-CATALOG-ID
&CREDATE	10	CREATION-DATE
&CREJOBN	8	CREATION-JOB-NAME
&CRETIME	8	CREATION-TIME
&CREUSID	8	CREATION-USER-ID

Table of the possible layout variables (part 1 of 3)

Name	Length	Meaning
&DEVNAM*	4	DEVICE-NAME
&DEVTYPE	8	DEVICE-TYPE
&DIRNAME	54	DIRECTORY-NAME
&DIROVOL	3	DIRECTORY-ON-VOLUME
&DOMAIN	8	DOMAIN
&EXPADDR	50	EXPORT-ADDRESS
&EXPDATE	10	EXPORT-DATE
&EXPIRAT	10	EXPIRATION-DATE
&FILENAM	41	FILE-NAME
&FILSEQ*	4	FILE-SEQ
&FIRSTV*	6	FIRST-VOLUME
&FREDATE	10	FREE-DATE
&FREELOC	8	FREE-LOCATION
&HOMELOC	8	HOME-LOCATION
&INITFL*	3	INITIALIZATION
&LACACCO	8	LAST-ACC-ACCOUNT
&LACCPUN	8	LAST-ACC-HOSTNAME
&LACDATE	10	LAST-ACC-DATE
&LACFFL*	2	LAST-ACC-FUNCTION-FLAG
&LACFNAM	8	LAST-ACC-FUNCTION-NAME
&LACJOBN	8	LAST-ACC-JOB-NAME
&LACSNO*	3	LAST-ACC-SNO
&LACTIME	8	LAST-ACC-TIME
&LACTSN*	4	LAST-ACC-TSN
&LACUSER	8	LAST-ACC-USER-ID
&LATEMPL	8	Last temporary location
&LAWRBCN	10	LAST-WRITE-BLOCK-CNT
&LCLDATE	10	LAST-CLOSE-DATE
&LCLTIME	8	LAST-CLOSE-TIME
&OPENMOD	8	OPEN-MODE
&ORDACCO	8	Ordering account number
&ORDCPUN	8	Ordering system name

Table of the possible layout variables (part 2 of 3)

Name	Length	Meaning
&ORDJOBN	8	Ordering job name
&ORDTSN*	4	Ordering TSN
&ORDUSER	8	Ordering user ID
&PASSWO*	4	PASSWORD
&REGDATE	10	REGISTRATION-DATE
&REMARKF	24	REMARK
&REMAR2	10	REMARK -2
&REMAR3	12	REMARK -3
&RESCNT*	4	RESERVATION-COUNT
&RESDATE	10	RESERVATION-DATE
&SUBSAVE	2	SubSave #
&SUBSEQU	3	SubSequence #
&SVIDSFI	15	SVID / SFID from ARCHIVE/HSMS
&TEMPLOC	8	TEMP-LOCATION
&TODDATE	10	Creation date for the receipt
&TODTIME	8	Creation time for the receipt
&USERACC	12	USER-ACCESS
&USERFIE	54	USER-FIELD
&USERIDE	8	USER-ID
&VOLGROU	32	VOLUME-GROUP
&VOLSEQ*	4	VOLUME-SEQUENCE
&VOLSTAT	8	VOLUME-STATUS
&VOLUME*	6	VOLUME-VSN

Table of the possible layout variables (part 3 of 3)

Those variables which end with an asterisk can be specified using 7 characters (without *) or 8 characters (with *).
Since the length of variables names (7 or 8 characters) is generally not the same as the length of the current values (2 to 54 characters), a number of rules must be observed when designing a layout.

Case 1:

All variables are specified with 8 characters (i.e. using * where applicable) and (if the length > 8) padded with blanks on the right to allow sufficient space for the current values to be incorporated in their entirety. This ensures that text is not misplaced when the export receipt is generated. This procedure has the advantage that the complete layout including all texts (particularly the right margin characters) can be designed with everything in the correct position. Current values with lengths between 2 and 6 are padded with blanks to a length of 8 characters.

Example

The following layout lines:

```
$&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&$
$          VSN = &VOLUME*                        FSEQ = &FILSEQ*         $
$                                                                        $
$       REMARK = &REMARKF                                                $
$      ACCESS# = &ACCCNT*                       SHARE = &USERACC         $
$&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&$
```

produce the following printed lines:

```
$&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&$
$          VSN = TAPE01                          FSEQ = 0001             $
$                                                                        $
$       REMARK = FILE BACKUP FEBRUARY                                    $
$      ACCESS# = 0005                           SHARE = FOREIGN-READ     $
$&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&$
```

Case 2:

If the current value of a layout variable is not required in its full length, the output length can be restricted by any character other than a blank. The minimum length is 8 characters.

Example

Only the first 20 characters of the file name are to be output. The following layout line :

```
|  FILENAME = &FILENAM            *  |
```

would produce the following printed line for the current value FILE-BACKUP-LIST.FEBRUARY:

```
|  FILENAME = FILE-BACKUP-LIST.FEB   |
```

Case 3:

By default, the current values for layout variables with a terminating asterisk are padded with blanks to a length of 8 characters. If this padding is not required, the variable names must be specified with 7 characters (i.e. without *).

Example

The following layout lines:

```
+------------------+
| &VOLUME/&FILSEQ |
+------------------+
```

produce the following printed lines:

```
+--------------+
| TAPE01/0001 |
+--------------+
```

2.6.3 Printer control characters

If the export receipts are to be automatically printed immediately (parameter EXPORT-RECEIPT=*PRINTER; see also the MARENADM statement MODIFY-MAREN-PARAMETERS), a SPOOL task is generated. The contents of column 1 will be interpreted as printer feed control characters (e.g. the letter “A” for a page feed). The result is the same as that produced with the command
`/PRINT-DOCUMENT ...,DOCUMENT-FORMAT=*TEXT(LINE-SPACING=*BY-EBCDIC-CONTROL).`

A page feed is automatically inserted at the beginning of the standard layout.

The export receipt in the standard layout shown on page 61 could be generated from the following layout file:

```
A  +-----------------------------------------------------------------------+
   |                                                                       |
   |                                                                       |
   |      M      M      AA      RRRRRR     EEEEEEEE   N     NN           |
   |      MM    MM     AAAA     RR   RR    EEEEEEEE   NN    NN           |
   |      MMM  MMM    AA  AA    RR    RR   EE         NNN   NN           |
   |      M MMM M   AA    AA   RR   RR    EE         NNNN  NN           |
   |      MM MM MM  AA    AA   RRRRRR     EEEEEEE    NN NN NN           |
   |      MM    MM  AA    AA   RR RR      EEEEEEE    NN NN NN           |
   |      MM    MM  AAAAAAAA   RR  RR     EE         NN  NNNN           |
   |      MM    MM  AA    AA   RR   RR    EE         NN   NNN           |
   |      MM    MM  AA    AA   RR    RR   EEEEEEEE   NN    NN           |
   |      MM    MM  AA    AA   RR     R   EEEEEEEE   NN     N           |
   |                                                                       |
   |                                                                       |
   +-----------------------------------------------------------------------+
   |                                                                       |
   |          M A R E N    E X P O R T   R E C E I P T                     |
   |                                                                       |
   +-----------------------------------------------------------------------+
   |          +----------+                                                 |
   |  VOLUME: | &VOLUME* |         (LAST-TEMP-LOCATION: MANUAL  )          |
   |          +----------+                                                 |
   |                                                                       |
   |                                                                       |
   |  EXPORT-AD: &EXPADDR                                                  |
   |                                                                       |
   |                                                 DATE: &TODDATE        |
   |                                                 TIME: &TODTIME        |
   |  SIGNATURE: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _                           |
   |                                                                       |
   +-----------------------------------------------------------------------+
   |  ORDERED BY: USER-ID : &ORDUSER                                       |
   |              ACCOUNT : &ORDACCO                                       |
   |              JOB-NAME: &ORDJOBN                                       |
   |              HOST    : &ORDCPUN                                       |
   |              TSN     : &ORDTSN*                                       |
   +-----------------------------------------------------------------------+
   |MAREN CATALOG ENTRY:                                                   |
   |                                                                       |
   |VOLUME    =&VOLUME*     FILE-SEQ=&FILSEQ*    DEV-TYPE   =&DEVTYPE    |
   |                                                                       |
   |USER-ID   =&USERID      HOME-LOC=&HOMELOC    RESERV-DATE=&RESDATE    |
   |ACCOUNT   =&ACCOUNT     FREE-LOC=&FREELOC    FREE-DATE  =&FREDATE    |
   |USER-ACC  =&USERACC     TEMP-LOC=&TEMPLOC    EXPORT-DATE=&EXPDATE    |
   |PASSWORD  =&PASSWO*                                                    |
   |REMARK    =&REMARKF                                                    |
   |EXPORT-AD =&EXPADDR                                                    |
   |USER-FIELD=&USERFIE                                                    |
   |FILE-NAME =&FILENAM                                                    |
   |DIR-NAME  =&DIRNAME                                                    |
   |FREE-POOL =&ARCHUSA                                                    |
   |OPEN-MODE =&OPENMOD   CR-DATE     =&CREDATE  LA-A-DATE  =&LACDATE     |
   |DEV-NAME  =&DEVNAM*   CR-TIME     =&CRETIME  LA-A-TIME  =&LACTIME     |
   |VOL-SEQ   =&VOLSEQ*   CR-CAT-ID   =&CRECAT   LA-A-USER  =&LACUSID     |
   |FIRST-VOL =&FIRSTV*   CR-USER-ID  =&CREUSID  LA-A-ACC   =&LACACCO     |
   |CLOSE-IND =&CLOSEI*   CR-JOB-NAME =&CREJOBN  LA-A-JOB-N =&LACJOBN     |
   |EXPIR-DATE=&EXPIRAT   LAST-CL-DATE=&LCLDATE  LA-A-TSN   =&LACTSN*     |
   |AUDIT     =&AUDITV*   LAST-CL-TIME=&LCLTIME  LA-A-SNO   =&LACSNO*     |
   |VOL-STATUS=&VOLSTAT   RESERV-COUNT=&RESCNT*  LA-A-HOST  =&LACCPUN     |
   |INIT      =&INITFL*   ACCESS-COUNT=&ACCCNT*  LA-A-FUNC-N=&LACFNAM     |
   |ADM-FIELD =&ADMFIEL   CHECK-COUNT =&CHECNT*  LA-A-FUNC-F=&LACFFL*     |
   |                                                                       |
   +-----------------------------------------------------------------------+
```

3 MAREN catalog

The MAREN catalog contains all the information needed to manage the tape inventories of a data center. This information can be created, modified, and inquired by MAREN components.

The BS2000 systems in a MAREN network access the same (central) MAREN catalog. See chapter “MAREN network and domains” on page 101.

The MAREN catalog consists of two files:

– Volume catalog (archive-number- or VSN-oriented)

– logging files (optional).

To prevent unauthorized access, both files should be created with the attribute USER-ACCESS=*OWNER-ONLY.

MAREN offers the operating modes “shared mode” and “exclusive mode” which differ in the access method to the MAREN catalog used by the systems involved, see section “Operating modes in MAREN” on page 47.

When domains are used in a MAREN network, all information about the domains is contained in the volume catalog. In this case the MAREN user and the Domain Administrator only access information on their own domains. See chapter “MAREN network and domains” on page 106.

Backup of the MAREN catalog

To avoid deadlock situations during data backup, the MAREN catalog has the backup level E and is usually excluded from data backups.

However, since the catalog must be restored in the event of a fault or loss, and a backup version is required for this, it is advisable to create copies of the MAREN volume catalog before a data center backup run (using the MARENADM statement COPY-VOLUME-CATALOG) and to include these copies in the data backup.

3.1 Volume catalog

The volume catalog has the following file structure:
`ACCESS-METHOD=ISAM,RECORD-FORMAT=V,KEY-POSITION=5,KEY-LENGTH=10`

The file must be set up with ACCESS=*WRITE.

The records of the volume catalog start with 1002 bytes for including the secondary indexes. Then come the catalog entry fields (1014 bytes). The total record length is then 2016 bytes.

The catalog entry fields are described in the table below. The structure of the catalog entry fields is defined by the MARENA macro. The individual catalog entry fields can be symbolically addressed in Assembler programs via the dummy section of the MARENA macro.

For COBOL programmers, the copy element MARENAC is provided. Allocation of the catalog entry fields to the field names of the dummy section of the MARENA macro or the output of SHOW-VOLUME-ATTRIBUTES is described in the appendix starting in section “Statement operands and volume catalog entry fields” on page 531.

Catalog entry field/ Length in bytes		**Designation / Value range / Meaning**
---	4	Record length field
VOLUME	6	VSN
FILE-SEQUENCE	4	File sequence number 0001,.....,9999 Corresponds to field 6 (file sequence number) in the HDR1 label.
		Note VOLUME and FILE-SEQUENCE together form the ISAM key.
FILE-NAME	41	File name (without catalog ID and user ID) for a tape file
---	1	Internal MAREN catalog entry field
CREATION-CAT-ID	4	Catalog ID from the file name at the time of file creation.
CREATION-USER-ID	8	User ID from the file name at the time of file creation.
		Note The preceding four catalog entry fields are combined to form the following catalog entry field DIRECTORY-NAME for all tapes contained in a directory.
DIRECTORY-NAME	54	Name of a directory (with catalog ID and user ID) which contains the tape.
USER-IDENTIFICATION	8	User ID of the owner Automatically entered by MAREN when a tape is reserved and then no longer modified.

Catalog entry field/ Length in bytes		Designation / Value range / Meaning
ACCOUNT	8	Account number of the tape owner The information for USER-IDENTIFICATION and ACCOUNT is taken automatically from the LOGON command of the user at reservation time.
REMARK	24	Remark field This catalog entry field is output in response to a SHOW statement. The owner should therefore complete this field using an explanatory text. It is possible to assign different text to each catalog entry of a VSN (different FSEQ).
USER-FIELD	54	User field Here the owner can enter any relevant data such as name, department, telephone number, or work scheduling data. It is possible to assign different text to each catalog entry of a archive number (different FSEQ).
EXPORT-ADDRESS	50	Mailing address The EXPORT-VOLUME statement can be used here to enter a mailing address, a short message, a mailbox number, etc.
		Note The above catalog entry fields REMARK, USER-FIELD, and EXPORT-ADDRESS are not provided with values by MAREN and are not evaluated. It is the responsibility of the user to provide these catalog entry fields with values.
USER-ACCESS	1	Shareability of the tape OWNER-ONLY: not shareable (default) FOREIGN-READ-ONLY: read access only ALL-USERS: unrestricted access
ARCHIVE-USAGE	1	ID for the HSMS/ARCHIVE free tape pool. Permitted values: *NO, *GLOBAL, *TSOS, <filename>.
PASSWORD	4	Password (default: 4X'00') A password entered in this catalog entry field is related to the tape and not the files on the tape. If a password exists, it must always be specified.
CHECK-COUNT	2	Check number (00 through 99) This MAREN-internal catalog entry field is incremented each time the catalog entry is modified (modulo 100); it is used for reorganization purposes, etc.
ACCESS-COUNT	4	Access counter (0000,....,9999) This counter is incremented each time the tape is accessed, also when exported.
FREE-LOCATION	8	Release location A tape is moved to this location during the release run.

Catalog entry field/ Length in bytes		Designation / Value range / Meaning
HOME-LOCATION	8	Permanent location A tape is moved to this location during the clear-up run.
TEMPORARY-LOCATION	8	Current location This catalog entry field designates the location where the tape can be found at the moment. If the tape is being processed, it contains the system name, unless the tape is at an external location or in an archive system.
		Note The catalog entry fields FREE-LOCATION, HOME-LOCATION, and TEMPORARY-LOCATION can contain either a system name or 'CENTRAL' for central archive, or another location name, e.g. 'TRESOR' or 'BRAND'.
DEVICE-TYPE	2	Device type of the tape
CREATION-JOB-NAME or REQUEST-NAME	8	for HSMS: REQUEST-NAME otherwise: CREATION-JOB-NAME
CREATION-TIME	8	Creation time (hh:mm:ss)
		Note The above catalog entry fields CREATION-JOB-NAME/REQUEST-NAME and CREATION-TIME are updated at OPEN time each time a file is created.
LAST-CLOSE-TIME	8	CLOSE time (hh:mm:ss)
		Note The above catalog entry field LAST-CLOSE-TIME is updated at CLOSE time in the case of output.
OPEN-MODE	2	OPEN type of last access
VOLUME-SEQUENCE	4	Tape sequence number (0001,....,0255) This catalog entry field corresponds to field 5 (file sequence number) in the HDR1 label.
FIRST-VOLUME	6	First archive number of the MF/MV set This catalog entry field corresponds to field 4 (file volume label) in the HDR1 label.
RESERVATION-COUNT	4	Reservation counter (0000,....,9999) This counter is incremented with each new reservation of the tape.

Catalog entry field/ Length in bytes		Designation / Value range / Meaning
INITIALIZATION	1	Initialization flag (YES/NO/ERASE) The value ERASE is only set by //MODIFY-VOLUME-ATTRIBUTES. 'YES' is set during tape processing: – if there are no default labels (e.g. HDR1) – or HDR3 is missing – or the access indicator in VOL1 is set to ' 1' – or the access indicator in HDR3 is set to ' 1'; – otherwise, 'NO' is set. 'YES' is set during MODIFY-VOLUME-ATTRIBUTES if the EXPIRATION DATE is decremented.
VOLUME-STATUS	1	Tape status FREE: free tape in the local data center PRIVATE: private tape. The tape has been exported from a foreign data center and added to the MAREN catalog of the local data center by means of IMPORT-FOREIGN-VOLUME. RESERVED: reserved tape in the local data center
CLOSE-INDICATOR	1	CLOSE indicator This catalog entry field provides information on whether creation of a tape file has been terminated correctly. At the start of creation, i.e. OPEN time, the indicator is set to 'OPEN'. If file creation is terminated by means of a CLOSE macro in the user program, MAREN sets the CLOSE indicator to 'CLOSED'. In many other cases, such as is the case with the TERM, LOGOFF, EXIT-JOB, CANCEL-JOB and SHUTDOWN macros as well as in the case of a system dump, an implicit CLOSE ALL does take place, but this does not affect the indicator.
LAST-ACCESS-SNO	3	Session number of the last access (001,...,255)
LAST-ACCESS-TIME	8	Time of the last access (hh:mm:ss)
LAST-ACCESS-TSN	4	Task sequence number (TSN) of the last access (only as long as the tape is allocated)
LAST-ACCESS-HOSTNAME	8	System name during the last access
LAST-ACCESS-JOB-NAME	8	Job name of the last access
LAST-ACCESS-USER-ID	8	User ID of the last access
LAST-ACCESS-ACCOUNT	8	Account number of the last access

Catalog entry field/ Length in bytes		Designation / Value range / Meaning
LAST-ACCESS-FUNCTION-FLAG	2	This MAREN-internal catalog entry field indicates the action last taken on the catalog entry or the tape. Possible values are, for example: ' 11': Add catalog entry ' 17': Reserve '23': Modify
LAST-ACCESS-FUNCTION-NAME	8	Function name This catalog entry field contains the name of the MAREN component or MAREN routine which last modified the catalog entry. For possible values, see section “Function names in MAREN” on page 534.
		Note The above catalog entry fields LAST-ACCESS-... are used internally for the transfer of program information when program interfaces are employed.
---	10	Start of number range: archive number and file sequence number
RETFLAG	1	This MAREN-internal catalog entry field indicates whether the last action attempted was executed successfully. .
ERRORKEY	7	This MAREN-internal catalog entry field contains the error key for the last action performed.
---	6	End of number range (archive number)
ADMINISTRATOR-FIELD	8	Administrator field Here any information can, for example, be stored via MAREN exits. When working with HSMS, the degree of tape utilization (number of PAM pages written to the tape) can be recorded here. This catalog entry field cannot be changed by the MAREN user.
AUDIT	1	Indicator byte bit 2^0: Audit flag When this bit is set, AUDIT=YES applies. In this event, MAREN monitors and, if necessary, rejects all access attempts on the relevant tape. This AUDIT flag is only evaluated if the MAREN administrator has set the system-specific parameter AUDIT to OPTIONAL.
FREE-POOL-NAME	54	Name of the free tape pool in which this tape is located or in which it should be located when it is shared.
PAM-PAGE-NUMBER	10	Number of blocks (not PAM pages) written to the tape concerned. This is transferred from DMS to MAREN at the end of every write operation (number is cumulated)
DEVICE-NAME	4	4-byte device name of the last tape device used. 2-byte device names are left-justified.
LAST-ACCESS-DATE	10	Date of the last access (`yyyy-mm-dd`)

Catalog entry field/ Length in bytes		Designation / Value range / Meaning
FREE-DATE	10	Expiration date (yyyy-mm-dd) This date specifies when the tape can be released, i.e. when the tape reservation for a specific user ID can be lifted. Release is effected by the administrator in the so-called release session using the MARENADM statement FREE-VOLUMES. In the case of tapes from a remote data center, this catalog entry field is not evaluated and contains blanks.
EXPIRATION-DATE	10	File expiration date (yyyy-mm-dd) This catalog entry field corresponds to the RETENTION-PERIOD entry in the ADD-FILE-LINK command or in field 10 (expiration date) in the HDR1 label, as long as it is not explicitly modified at a later date.
EXPORT-DATE	10	Export date (yyyy-mm-dd) For tapes which are not exported, this catalog entry field contains blanks.
CREATION-DATE	10	Creation date (yyyy-mm-dd)
LAST-CLOSE-DATE	10	CLOSE date (yyyy-mm-dd) In the case of OUTPUT, the catalog entry field is updated at CLOSE time (see LAST-CLOSE-TIME).
RESERVATION-DATE	10	Reservation date (yyyy-mm-dd) Date when a tape was reserved in the local data center or when a tape was added to the local data center's MAREN catalog from a remote data center.
SAVE-FILE-ID	15	SAVE-FILE (HSMS) or SAVE-VERSION (ARCHIVE)
SUBSAVE	3	Number of subtask for parallel save run in HSMS/ARCHIVE
SUBSEQUENCE	2	Number of subsequent tape within a save run in HSMS
DIR-ON-VOL	1	Displays whether a directory is stored at the end of the tape
DOMAIN-NAME	8	If domains are being used, the name of the domain to which the relevant tape belongs. Otherwise blanks for '*STD-DOM'.
ADMINISTR-FIELD-2	16	Freely definable administrator field
REMARK2	10	User field which can be freely set
REMARK3	12	User field which can be freely set
ACCESS-COUNT	8	Access counter (00000000, ..., 99999999). This counter is incremented each time the tape is accessed, also when exported.
VOLUME-GROUP	32	Name of the volume group
REGISTRATION-DATE	10	Date on which the tape was added to the MAREN catalog (yyyy-mm-dd).

3.2 Logging files

The logging files have the following file structure:
`ACCESS-METHOD=ISAM,RECORD-FORMAT=V,KEY-POSITION=5,KEY-LENGTH=32`

The ISAM key consists of the archive number, the file sequence number, the date, the time and the catalog ID. This ensures that the logging records will still be unique even if several logging files from different systems are combined.
The complete, updated catalog entry is logged on the basis of the ISAM key. Its length depends on the format of the MAREN catalog. The length of the logging records is 1050 bytes.

If no other block size was selected when assigning the logging file in the start procedure for the control program, the logging file is created with BUFFER-LENGTH=STD(1).
Exception: If the logging file is created on an NK4 pubset, it is given a block size of (STD,2).

Record structure of the logging file

Length in bytes	Designation / Value range / Meaning	
4	Record length field	
6 4 10 8 4	VSN File sequence number Date `yyyy-mm-dd`. Time (`hh:mm:ss`) Four-character catalog ID of the home pubset of the system where the modification of the catalog entry originated.	These fields form the ISAM key
1014	Complete, i.e. already updated catalog entry.	

If the system-specific MAREN parameter LOGGING is included, a record is written to a logging file every time a change is made to a catalog entry.

For performance reasons, as well as for increasing availability and maintaining data security, a separate logging file is kept for each system. If the parameter SHARED-UPDATE=*YES has been specified in the file allocation for a logging file, the MARENADM statement SHOW-MAREN-FILE can be used to access the current logging file.

Modifications of the MAREN parameter, e.g. via MODIFY-MAREN-PARAMETERS, will also be written to the logging file.

Variable block size for the MAREN logging file

If a logging file is assigned in the MARENCP start procedure, the command ADD-FILE-LINK with the parameter BUFFER-LENGTH=*STD(SIZE=n) can be used to specify a block size other than the standard block size. The user must ensure that sufficient storage space is reserved when assigning the file. With a blocking factor of n, the primary allocation (PRIMARY ALLOCATION) must be at least 2n+1 for K-ISAM and at least 2n+2 for NK-ISAM; the secondary allocation (SECONDARY-ALLOCATION) must be at least n.

If a new logging file is opened later during an active MAREN session by means of the MARENADM statement CHANGE-LOGGING-FILE, this is opened with the same blocking factor and the same secondary allocation as the previous logging file and with a sufficiently large primary allocation.

If the new logging file is created on an NK4 pubset, the old logging file must have an even-numbered block size, e.g. STD(2). If this is not the case, MARENCP is aborted.

Updating the MAREN catalog

The MARENADM statement UPDATE-MAREN-CATALOG and all the information from the logging files enable the MAREN catalog to be brought up to the current status or reconstructed if inconsistentcies or defects occur, see section “Catalog inconsistency” on page 525.

3.3 File version in the MAREN catalog

When data is written to a tape, the name of the tape file, together with other features, is stored in the MAREN catalog entries of the tapes used. (Exception: This does not apply in the case of an save run involving a directory.) This makes it possible to determine which tapes contain a tape file (statement SHOW-VOLUME-ATTRIBUTES FILE-NAME=...).

The MAREN catalog contains several versions of a tape file if the same tape file was created at different times and using different tapes and if the relevant tapes have not yet been released in the MAREN catalog. These individual versions of a file are not distinguished by their file name, as are, for example, file generations.

The tapes belonging to a file version form a tape set in the MAREN catalog. Used in this context, however, the term “tape set” is only loosely related to the term as used in a number of BS2000 commands (e.g. CREATE-TAPE-SET).

The common feature of a tape set and thus of a file version in the MAREN catalog is the fact that in all associated tapes the fields FILE-NAME and FIRST-VOLUME are identical in the MAREN catalog, FIRST-VOLUME containing the archive number of the first tape to which this file version has been written.

The order in which data was written to the tapes when creating the file can be determined with the aid of the VOLUME-SEQUENCE catalog entry field. This catalog entry field is given the value 1 for the first tape, the value 2 for the second tape, etc.

If only one tape was required for the creation of a tape file, the tape set then consists of a single tape and no additional tapes are required to access this file version.

In addition, there are other catalog entry fields for each file on the tape which MAREN evaluates when determining a file version. These include:

– CREATION-DATE: Date when a file was last written to the tape.

– CREATION-TIME: Time when a file was last written to the tape.

– CLOSE-INDICATOR: Indicator showing whether the tape was properly closed when the tape file was created.

– USER-IDENTIFICATION: User ID to which the tape is assigned in the MAREN catalog. However, this catalog entry field is relevant only if selection is to be based on user IDs.

– DEVICE-TYPE: If a device type was specified explicitly in the IMPORT-FILE (or FILE) command, only MAREN catalog entries with exactly this device type are used to determine the file version.

Tape- sets can be addressed explicitly with various statements. The MODIFY-TAPE-SET-ATTRIBUTES statement is available as a special statement for modifying MAREN catalog entries for a tape file.

3.4 Utilization level of tapes

The catalog entry field LAST-WRITE-BLOCK-COUNT is supplied with a block counter by MAREN. This indicates the number of blocks (not PAM pages) occupied on the tape.

When tape processing is terminated, the device's BLOCK-ID is read and the number of blocks used is determined. This is not done when tapes are read.

The information on a tape's occupancy level supplied by the block counter must be interpreted in view of a variety of factors such as the following:

– tape length
– number of tracks
– state of the MTC
– state of the read/write head
– number of files
– number of gaps between blocks
– size of the gaps between blocks
– is the block size recorded
– compression factor (determined by the device)
– entries in tape administration block 0 (e.g. fault administration by the device)

Each time a file located on a tape is closed, the block counter or LAST-WRITE-BLOCK-COUNT field is supplied with a value. If FSEQ > 0001, the catalog entry field contains the number of blocks of the relevant archive number including this file. If FSEQ = 0001, the catalog entry field contains the total number of blocks of the relevant archive number (not the number of blocks up to the end of the file for FSEQ =0001).

If a tape contains 10 files, for instance, and the file is extended with FSEQ=0002 or rewritten, the files with FSEQ=0003 to FSEQ=0010 can no longer be accessed although their catalog entries are still available. The file with FSEQ=0001 then has the same value in the LAST-WRITE-BLOCK-COUNT catalog entry field as the file with FSEQ=0002.

4 Managing tapes

When a tape is introduced for the first time in a data center, it is free. Before a volume can be used for the first time it must be initialized.
When an application requests a volume, it is reserved. A volume is not available for other applications as long as a reservation exists.
Once the expiration date has been reached, a tape can be released again. Before it may be used again by another application it has to be reinitialized. When a tape it reserved, it can be exported to remote data center.

4.1 Life cycle and states of a tape

A tape's life cycle is basically characterized by constant alternations between the tape states "free" and "reserved". Other states a tape might have are "to initialize", "exported" and "foreign (private)".

The states are represented by the following catalog entry fields in the MAREN catalog:

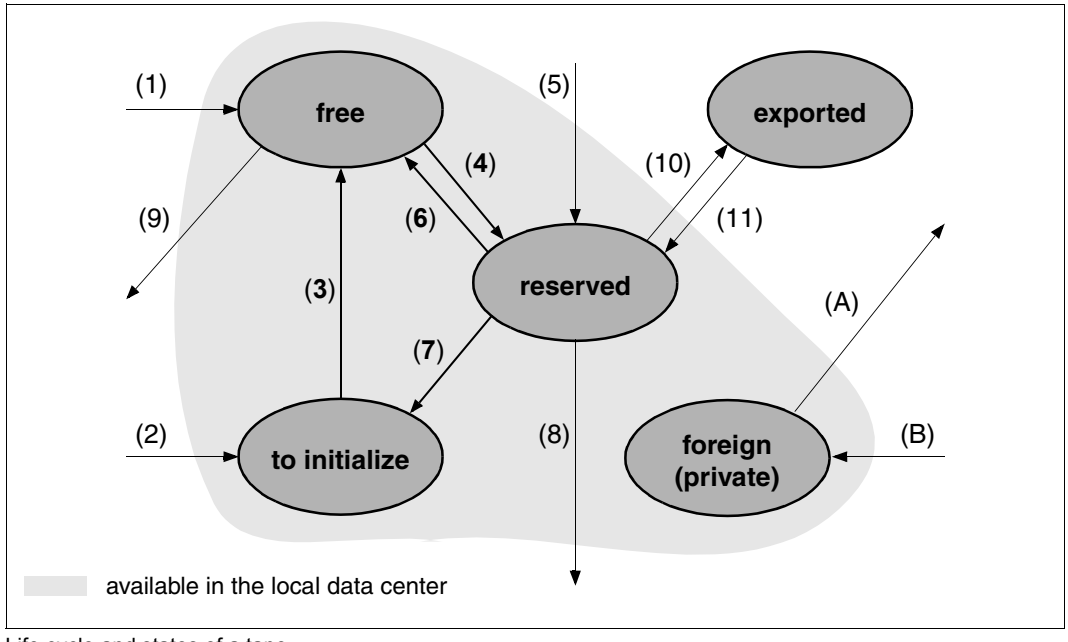
free: VOLUME-STATUS=FREE

to-initialize:
VOLUME-STATUS=RESERVED and USER-ID=SYSMAREN/<other id for volumes that are to be initialized>

reserved: VOLUME-STATUS=RESERVED

exported: VOLUME-STATUS=RESERVED and EXPORT-DATE=<date of last export>

foreign (private):
VOLUME-STATUS=PRIVATE



Life cycle and states of a tape

(1) A free tape is included in the tape inventory of a data center with the ADD-FREE-VOLUMES statement. If the tape was already initialized for some prior use, it can be utilized right away. In the MAREN catalog, the tape is assigned VOLUME-STATUS=FREE.

(2) A free tape (that needs to be initialized before it is used) is added to a data center's tape inventory with the ADD-FREE-VOLUMES INIT=*YES statement.

(3) A volume is initialized with the INITIALIZE-VOLUMES statement.
In the MAREN catalog, the tape is assigned VOLUME-STATUS=FREE.

(4) A free tape can be reserved with the RESERVE-FREE-VOLUMES statement. If MARENUCP automatic free tape allocation is activated, then it will implicitly reserve a free tape when no particular archive number is requested.
In the MAREN catalog, the tape is assigned VOLUME-STATUS=RESERVED.

(5) The ADD-RESERVED-VOLUME statement generates a catalog entry with VOLUME-STATUS=RESERVED for a tape that already exists in the data center but is not known in the MAREN catalog.

(6) If a reserved tape has reached the expiration date, it can be released with FREE-VOLUMES. If it is to be reinitialized before it is used again, the operand INIT-FILE=*NONE is set.

In the MAREN catalog, the tape is assigned VOLUME-STATUS=FREE.

(7) With FREE-VOLUMES INIT-FILE=<anything-but-*NONE>, the tape has to be reinitialized before it is used again. The tape is reserved for a specific user ID until it is reinitialized (default: SYSMAREN). The VOLUME-STATUS=RESERVED is retained for the time being.

(8),(9) Tapes with VOLUME-STATUS=RESERVED or free tapes with VOLUME-STATUS=FREE can be removed from the tape inventory of a data center at any time (with the REMOVE-USER-VOLUMES or REMOVE-FREE-VOLUMES statement). The DELETE-VOLUME-ENTRY statement deletes a catalog entry with any status.

(10),(11)
Reserved tapes can be exchanged with a remote data center. This is done with the aid of the EXPORT-VOLUME and IMPORT-VOLUME statements. Exported tapes cannot be used in the local data center.

(A),(B) A tape from a remote data center can be used temporarily in the local data center. It has to be exported from the foreign computer center (EXPORT-VOLUME statement in the foreign computer center) and imported in your own computer center with the IMPORT-FOREIGN-VOLUME statement for that purpose. In the MAREN catalog, the tape is assigned VOLUME-STATUS=PRIVATE.
The foreign tape is exported again from the MAREN catalog of the local data center with the EXPORT-VOLUME statement.

4.2 Tape type (volume type)

A tape type (volume type) can be defined freely in MAREN.

System operations such as tape initialization and automatic free tape allocation are, however, restricted to the area supported by BS2000. MAREN supports tape operation for all volume types offered by BS2000.

A tape of a volume type can only be processed on tape devices with a compatible device type.

The volume types and device types supported (depending on the BS2000 version) are listed in the manual “System Installation” [6].

MAREN supports the volume types used by all device types returned by BS2000 when MARENUCP or MARENADM is started.

When the I/O configuration is changed dynamically, a new device type may need to be included in the system-specific MAREN parameters using the MARENADM statement MODIFY-MAREN-PARAMETERS RESERVE-DEVICE-TYPES.

4.3 Foreign tape types

MAREN also supports tape types which cannot be processed in BS2000. It is therefore possible to store administrative data on these tapes in the MAREN catalog.

For these foreign tape types MAREN supports all functions which do not perform tape processing. The catalog entry fields are assigned suitable values. The MAREN user is responsible for entering meaningful values.

The following statements are available to the MAREN administrator for administering the foreign tape types:

- ADD-FOREIGN-DEVICE-TYPE
- REMOVE-FOREIGN-DEVICE-TYPE
- RENAME-FOREIGN-DEVICE-TYPE
- SHOW-FOREIGN-DEVICE-TYPES

When domains are used, the MARENADM statements ADD-FOREIGN-DEVICE-TYPE, REMOVE-FOREIGN-DEVICE-TYPE and RENAME-FOREIGN-DEVICE-TYPE are available only to the Domain Administrator, SHOW-FOREIGN-DEVICE-TYPES also to the Domain Administrator.

Up to 16 foreign tape types can be included in the MAREN catalog. MAREN encrypts the types internally in the following order: The first entry is encrypted with X'0001', the second with X'0002', the tenth X'000A' and the sixteenth with X'0010' in the catalog entry field DEVICE.

Restrictions

When working with foreign tape types the following restrictions must be taken into consideration:

- Only names which are not known to BS2000 may be used for the foreign tape types. Abbreviations must also be taken into account.
- The MARENADM statement FREE-VOLUMES does not evaluate the INIT flag.
- The MARENADM statement FREE-VOLUMES releases tapes after the expiration date has been reached without any further check.
- The free tape administrator MARENUCP does not support foreign tape types.
- The MARENADM statement INIT-VOLUME rejects a foreign tape type in the case of the DEVICE-TYPE operand.

Example

CDs are to be added to the MAREN catalog. The user ID MAINT administers the CDs and the service stores them.

The MAREN administrator proceeds as follows:

1. Load MARENADM. If (as in this example) domains are being used, the administrator then switches to the role of the ADA (here without entering a password).

```
/START-MARENADM
%  MARM100 MARENADM VERSION '<version>' STARTED
%  MARM091 MARENADM is working in 'DOMAIN-MODE'

//MODIFY-ADMINISTRATION-SCOPE DOMAIN=*ALL
%  MARM091 MARENADM is working in 'ALL-DOMAIN-MODE'
```

2. Add tape type CD:

```
//ADD-FOREIGN-DEVICE-TYPE DEVICE-TYPE=CD
%  MARM030 The foreign-device-type 'CD' is announced to MAREN with the
volume-type x'0001'.
```

3. Permit tapes type CD for reservations:

```
//MODIFY-MAREN-PARAMETERS
    RESERVE-DEVICE-TYPES=*PARAMETERS(DEVICE-TYPE=CD)
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

4. Add free tapes of the type CD to the catalog:

```
//ADD-FREE-VOLUMES VOLUME=*INTERVAL(FROM=CD0001,TO=CD0003),
    FREE-LOCATION=PCSERVIC,DEVICE-TYPE=CD
%  MARM108 MAREN CATALOG ENTRY 'CD0001'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'CD0002'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'CD0003'/'0001' ADDED
%  MARM120 TOTAL OF 3 MAREN CATALOG ENTRIES PROCESSED
```

5. Reserve two tapes of the type CD:

   Here a non-existent file name START-CD is stored. This can be used later to ascertain all such CDs in the MAREN catalog simply and efficiently. Furthermore, two additional remarks are entered.

```
//RESERVE-FREE-VOLUME USER-IDENTIFICATION=MAINT,
    NUMBER-OF-VOLUMES=2,SELECT=*BY-ATTRIBUTES(VOLUME=*ALL,
    DEVICE-TYPE=CD,HOME-LOCATION=PCSERVIC),FILE-NAME=
    START-CD,REMARK=C'WINDOWS REGISTRY',REMARK-2=C'PC-NAME'
%  MARM127 VOLUME 'CD0001' RESERVERD FOR USERID 'MAINT'
%  MARM127 VOLUME 'CD0002' RESERVERD FOR USERID 'MAINT'
```

6. Modify the attributes of the tapes, for instance by entering information in the USER-FIELD operand:

```
//MODIFY-VOLUME-ATTRIBUTES VOLUME=CD0001,USER-FIELD=C'BACKUP'
%  MARM121 MAREN CATALOG ENTRY 'CD0001'/'0001' MODIFIED
```

7. Display the attributes of tape CD0001:

```
//SHOW-VOLUME-ATTRIBUTES VOLUME=CD0001,INFORMATION=*NORMAL
VOLUME    = CD0001       FILE-SEQ      = 0001        DEV-TYPE    = CD
USER-ID   = MAINT        HOME-LOCATION = PCSERVIC    RESERV-DATE = <date>
ACCOUNT   =              FREE-LOCATION = PCSERVIC    FREE-DATE   = <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = PCSERVIC    EXPORT-DATE =
PASSWORD  = NONE
REMARK    = C'WINDOWS REGISTRY   '
EXPORT-AD = C'                                                  '
USER-FIELD= C'BACKUP '
FILE-NAME = START-CD
FREE-POOL = *NO
OPEN-MODE =            CR-DATE      =            LAST-ACC-DATE    =
DEV-NAME  =            CR-TIME      =            LAST-ACC-TIME    =
VOL-SEQ   = 0001       CR-CAT-ID    =            LAST-ACC-USER-ID =
FIRST-VOL =            CR-USER-ID   =            LAST-ACC-ACCOUNT =
CLOSE-IND =            CR-JOB-NAME  =            LAST-ACC-JOB-NAME=
EXPIR-DATE=            LAST-CL-DATE =            LAST-ACC-TSN     =
AUDIT     = NO         LAST-CL-TIME =            LAST-ACC-SNO     =
VOL-STATUS= RESERVED   RESERV-COUNT = 0002       LAST-ACC-HOSTNAME=
INIT      = NO         ACCESS-COUNT = 00000000   LAST-ACC-FUN-NAME= MODIFY1
ADM-FIELD = C'        'CHECK-COUNT  = 06         LAST-ACC-FUN-FLAG= 23
```

4.4 Free pool

Every tape, regardless of whether it is free or reserved, is connected to a free pool. If it is free, then it is located in this free pool. If it is reserved, it is assigned to this free pool when it is released. MAREN knows and manages all free pools by means of their names in the MAREN catalog. Even a free tape pool that does not contain any free tapes may still be needed later. If no tapes reference this pool name, the administration block can be deleted (MARENADM statement `MODIFY-MAREN-PARAMETERS FREE-POOLS=*PARAMETERS(FREE-POOL=...,ACTION=*REMOVE`). Deletion can only be performed explicitly by the All-Domain Administrator (ADA).

When a free tape is requested, a free tape pool is found that can be used to meet the demand. If is no suitable tape free there, the operating staff is requested to make a suitable tape available in this free pool.

The MAREN free pool can be roughly split up into two areas:

- free tapes prereserved for HSMS/ARCHIVE applications (`FREE-POOL=*TSOS/*GLOBAL/<dir-name>`)
- in pools for free tapes for applications that are not specified (`FREE-POOL=*NO`), e.g. for requests via the command CREATE-FILE.

Free tapes for HSMS/ARCHIVE applications can only be reserved in the course of an HSMS/ARCHIVE run. Depending on their allocation, they can be split up into the following groups:

- Tapes prereserved for HSMS/ARCHIVE applications in a specific directory (`<dir-name>` tape pool)
- Tapes prereserved for HSMS/ARCHIVE applications under the TSOS user ID (`TSOS` tape pool)
- Tapes prereserved for all other HSMS/ARCHIVE applications (`GLOBAL` tape pool)

See also the section “HSMS/ARCHIVE free tape pools in the MAREN catalog” on page 161.

Tapes of the pools *TSOS/`<dir-name>` are reservered for HSMS/ARCHIVE applications. *GLOBAL tapes cannot only be used by ARCHIVE, but also by other applications.

Examples of how free pools are operated are provided on page 491.

A tape's allocation determines its location after it has been processed with HSMS/ARCHIVE. Tape reservation in HSMS/ARCHIVE is closely linked with MARENUCP automatic free tape allocation.

When HSMS/ARCHIVE requests a tape, MAREN will search for an appropriate volume using the following criteria in the order given below:

1. If a request is received for a specific directory, a tape is reserved that was prereserved for that specific directory (FREE-POOL=<dir-name>).
2. If a request is received from an HSMS/ARCHIVE application running under the TSOS user ID and if there is no free tape pool for the specified directory, then a tape is reserved that is prereserved for HSMS/ARCHIVE applications running under TSOS (FREE-POOL=*TSOS). The free pool *TSOS is selected only if the user ID TSOS is the directory owner.
3. A tape is reserved that was prereserved for optional HSMS/ARCHIVE applications (FREE-POOL= *GLOBAL) under the following conditions: A request is received from any other HSMS/ARCHIVE application resp. HSMS/ARCHIVE is running and the owner of the directories is not TSOS and no free pool exists for the specified directory.
4. In all other cases, a free tape is taken from the free tape pool that has no reservations for HSMS/ARCHIVE (FREE-POOL=*NO).

The tapes can only be released following a PURGE run in ARCHIVE.

The MARENADM statement FREE-VOLUMES returns the tapes to the free pool assigned to them. Assignment to the free pools can take place with the ADD-FREE-VOLUMES and MODIFY-VOLUME-ATTRIBUTES statements.

4.5 Reserving free tapes

Free tapes can be reserved either explicitly using the MAREN or MARENADM statement RESERVE-FREE-VOLUME or implicitly using automatic free tape allocation with MARENUCP, see the “MAREN User Guide” [1].

Automatic free tape allocation can be controlled using MAREN exits.

The reservation of free tapes according to locations with specific features (user ID, job name, file name, etc.) can also be influenced via a reservation file (see the section “Location management via a reservation file” on page 126).

4.6 Exporting and importing tapes

When a tape is to be exported to a remote data center, it must be removed from the MAREN catalog of the local data center using the MARENADM statement EXPORT-VOLUME.

When the tape is received by the remote data center, the MAREN administrator there adds it to the MAREN catalog in the data center using the MARENADM statement IMPORT-FOREIGN-VOLUME. In this procedure, an archive number that already exists in the MAREN catalog may be specified and entered. While the foreign tape is used in the remote data center, the tape with the same archive number which already existed there cannot be used.

After the tape has been processed in the remote data center, it is removed from the MAREN catalog there using the MARENADM statement EXPORT-VOLUME. From this point in time, the original tape with the same archive number can be used again.

While the tape is exported from the dispatching data center, the system there cannot access it. When it is returned to the local data center, it must explicitly be made available again using the MARENADM statement IMPORT-VOLUME.

If the tape belongs to a location served by an archive system, the export and import operations are performed together with the eject and insert operations at the archive system’s import/export unit.

A virtual tape from a virtual archive system cannot be exported.

4.7 Encrypting tapes

LTO drives which incorporate the hardware feature “tape encryption” can write data to the tape in encrypted form and decrypt the data again when the tape is read.

Encryption on the drive implements data protection at tape level and protects the tape contents against unauthorized reading. This enables tape contents to be protected against misuse, above all outside the protective operation in the data center, e.g. during transport, external storage, and tape export.

Encryption and decryption are performed by the hardware in the drives. Tape encryption is selectable; by default it is disabled. Encryption has only a minimal effect on the access times.

To perform encryption, the LTO drive requires a 256-bit string as a **data key**. The drive uses the AES encryption method and the data key to encrypt the data when it is written to the tape. As the encryption method is symmetrical, the same data key is required to decrypt the data again when it is accessed for reading.

If data compression is enabled for the driving, the data is initially compressed when it is written and then encrypted.

A virtual tape from a virtual archive system cannot be encrypted.

Use of tape encryption by BS2000

BS2000 and MAREN support tape encryption.

MAREN generates the data key function required and supplies it to the drive, which then performs encryption. To permit the tape contents to be decrypted again, MAREN stores the data key in the metadata on the tape. The data key is stored in encrypted form to protect against unauthorized access.

The encryption key which MAREN keeps safely in a key box is used to encrypt the data key.

When an encrypted tape is read, MAREN fetches the appropriate encryption key from the key box, decrypts the data key and, by means of PTAM, supplies it to the drive, which decrypts the tape data again. On the basis of the volume type specification, the application determines whether an encrypted tape is accessed.

Each tape is encrypted with a separate data key. All of a tape’s data blocks are encrypted with the same data key. A new key is assigned each time the tape is reserved again.

MAREN makes interfaces for creating and managing encryption keys available to the encryption key administrator (MAREN administrator with the TAPE-KEY-ADMINISTRATION privilege) by means of the MARENEKM utility routine. By default this privilege is assigned to the SYSMAREN system ID.

Encryption key

The encryption key administrator creates encryption keys using the CREATE-ENCRYPTION-KEY statement. An encryption key consists of the **key ID** and the **key value**.

The key ID is assigned by MAREN and is used to find the encryption key, which is required for decryption. It consists of a total of 18 characters and has the following format:

`<prefix>-<date>-<time>`

Meaning:

`<prefix>`	4-character long prefix (specified by the caller in the PREFIX-OF-KEY-ID operand)
`<date>`	Creation date in the format `yymmdd` (set by MAREN)
`<time>`	Creation time in the format `hhmmss` (set by MAREN)

The key value, which is up to 256 bytes long and is used to encrypt the data key, is determined by the caller.

The encryption key administrator can create a new encryption key at any time. An encryption key is used for encryption only if it has been specified explicitly as the write encryption key using the SET-WRITE-ENCRYPTION-KEY statement. All data keys of the tapes are encrypted using the same encryption key until a new write encryption key has been defined.

The encryption keys are stored in a key box and fetched from there when encryption or decryption is performed.

CAUTION! An additional copy of the encryption key must always be stored:

- The encryption key administrator **must** make a note of the encryption key, which consists of the key ID **and** key value, and store this in a safe place (e.g. a safe).
- The encryption key must be stored for as long as tapes which are encrypted with it are used.

It is essential to store an additional copy of the encryption key in case the key box is destroyed and it can also not be reconstructed from a backup. Without the encryption key, the tape contents which it was used to encrypt can no longer be decrypted.

Key box

The key box is a specially protected ISAM file in which encryption keys are stored. Key boxes are created on a system-specific basis. When encrypted tapes are to be written on a system, an encryption key must be defined as the write encryption key. When a tape is encrypted or decrypted, MAREN accesses the system key box of the system on which the access take place. The system key box has the fixed name `$SYSMAREN.MAREN.KEY-BOX` and resides on the home pubset. If no system key box exists yet, MAREN creates one when an encryption key is saved.

The administrator can create further system key boxes, for example for backup purposes. Such “private” key boxes can also only be accessed using MARENEKM.

Managing the encryption keys

Management of the encryption keys with MARENEKM is domain-specific. The statements can be assigned for one, more than one or all systems in the home domain. To permit this, all the systems must belong to the same domain. If a system (temporarily) does not belong to the same MSCF network as the home system, this is reported and the action must be repeated for this system. Systems which belong to another domain are ignored.

Managing the key box

The key box is also managed with MARENEKM on a host-specific basis. The key box and domain record in the MAREN catalog are permanently linked to each other by a joint identification number. This assignment is checked each time an action is executed. This prevents, for example, a stolen key box from being used in another domain.

Transfer of a key box to another domain is supported for reconfiguration purposes. In this case a transfer key box can be created which can be imported only on a defined system using a defined password. A transfer key box cannot be used for any other purpose.

If a key box which was backed up in encrypted form is to be restored, at least one “mini key box” containing the encrypted backup tape’s encryption key must be stored on this system. If this data was also stored in a “safe” (this should be the rule!), it can be reconstructed from there.

Volume types for tape encryption

NDM supports the volume types of the LTO drives which can also be specified at command and program interfaces by DVS and HSMS/ARCHIVE. By means of the volume type specification the user decides whether his/her data is to be written to an LTO tape in encrypted or unencrypted form:

- TAPE-Ux without encryption
- TAPE-UxE with encryption

Free LTO tapes are always entered in the MAREN catalog as volume type TAPE-Ux. Free encrypted LTO tapes cannot be added using the //ADD-FREE-VOLUME statement. Nor can they be specified in the SHOW-, REMOVE- and SECURE-FREE-VOLUMES statements.

Only when an encrypted tape is reserved (using //RESERVE-FREE-VOLUME or by means of a request via DMS, ARCHIVE, PERCON, FDDRL or NDM) is the volume type TAPE-UxE entered in the MAREN catalog instead of TAPE-Ux.

The volume type TAPE-UxE is also entered in the MAREN catalog if it was specified in the DEVICE-TYPE operand of the ADD-RESERVED-VOLUME or IMPORT-FOREIGN-VOLUME statement.

When an encrypted tape is released using FREE-VOLUME, the volume type is changed back to TAPE-Ux in the MAREN catalog.

As soon as a tape has been reserved (`RESERVED` status), applications must access the tape using the correct volume type when they read from or write to it. In other words a tape with the type TAPE-UxE cannot be accessed by means of DEVICE=TAPE-Ux and vice versa.

Tape export

An encrypted tape which has been exported from a remote data center and entered in the MAREN catalog there using the IMPORT-FOREIGN-VOLUME statement can be read only if the encryption key created in the remote data center has been transferred to the home key box. This transfer is executed using a compiled S procedure which was created when the tape was exported (using EXPORT-VOLUME). After the foreign tape has been entered by means of IMPORT-FOREIGN-VOLUME with DEVICE-TYPE=TAPE-UxE, the MAREN administrator must start the S procedure explicitly. The administrator is notified of this by a message to this effect when the IMPORT-FOREIGN-VOLUME statement is executed.

After the exported tape has been returned, the MAREN administrator uses EXPORT-VOLUME statement to delete the associated entry from the MAREN catalog. This also implicitly deletes the entry in the key box.

Note on data privacy and data protection

As separate encryption data can be generated for each tape, the tape contents can be encrypted only using the associated procedure file. To prevent the tape plus the encryption data from falling into the wrong hands, the two should be sent separately. The following procedure is recommended:

- Send the tape to the partner.
- Wait for confirmation of receipt.
- Send the encryption data (procedure file) to the partner (e.g. by means of File Transfer or by email).

The software product SDF-P is required to create the compiled S procedure (using the EXPORT-VOLUME statement). The S procedure can already execute with SDF-P-BASYS.

4.8 MAREN checks

When tapes are reserved and processed in BS2000 (NDM, DVS), MAREN automatically becomes active for the following activities:

- Access control
- Availability checking
- updating of archive entries
- Outputting transport messages
- Using the DEVICE parameter
- Determining the archive number for a tape file

BS2000 and MAREN work together when the following events occur:

- occupying a tape
- creating a TFT entry
- opening files
- changing a tape
- closing files
- releasing a tape

Some checks and tests can be disabled using MAREN parameters, see section “Setting MAREN parameters” on page 31. The BS2000 checks are always carried out, independent of MAREN.

Access control

Before each access to a tape, a check is made as to whether the following conditions have been met:

- If domains are being used the tape must belong to the domain to which the system also belongs, or the tape must belong to the standard domain *STD-DOM.
- If the tape is assigned to a foreign user ID, the USER-ACCESS attribute must be set to ALL-USERS or FOREIGN-READ-ONLY (exception: TSOS).
- If the tape is password-protected, the appropriate ADD-PASSWORD command must first be entered.
- If the tape is assigned to an HSMS/ARCHIVE free pool *TSOS/<dir-name>, this tape may only be accessed using HSMS/ARCHIVE.

- If, in the case of OUTPUT, the tape is assigned to a foreign user ID, the USER-ACCESS attribute must be set to USER-ACCESS=ALL-USERS (exception: TSOS).
- If the tape is to be used for output operations, the file expiration date must be less than or equal to the current date.
- If MAREN exits are being used, these must permit access.

If any of these conditions is not fulfilled, access is rejected and an appropriate message is sent to SYSOUT.

The information which is relevant for a tape in an HSMS or ARCHIVE run is noted in MAREN. This includes directory file, save file ID, subsave number, expiration date, request name, and job name. When the tapes are accessed under HSMS and ARCHIVE, the directory file and save file ID are checked. This is also the case when save files are updated and also when save files are restored or released.

If the tape has the attribute VOLUME-STATUS=FREE, implicit reservation is carried out (only for HSMS and ARCHIVE) provided that the following conditions are fulfilled:

- The tape must be contained in the appropriate pool of free tapes (see section “Free pool” on page 87).
- The tape must not be intended for the automatic free tape allocation facility MARENUCP (see the SECURE-FREE-VOLUMES statement).
- The volume type must be permitted for new reservations (see the RESERVE-DEVICE-TYPES operand in the MODIFY-MAREN-PARAMETERS statement).

If the tape has the attribute VOLUME-STATUS=RESERVED or PRIVATE, the following conditions must be fulfilled:

- If DIR=NONE applies, the tape must not be contained in a directory.
- If `DIR=<file-name>` applies, the tape must be assigned to the user’s own ID (exception: TSOS).
- The attribute FREE-POOL for the tape must match the existing free pools.

Availability checking

Before any access is made to a tape, a check is made to see whether the following conditions for availability are fulfilled:

- The tape must be entered in the MAREN catalog. If domains are being used the tape must belong to the domain to which the system also belongs, or the tape must belong to the standard domain *STD-DOM. Exception: If the system-specific MAREN parameter FOREIGN-TAPE-CHECK=*NO is set the tape needs not to be entered in the MAREN catalog .
- The tape must not have been exported.
- The tape must have the attribute VOLUME-STATUS=RESERVED or PRIVATE.
- The tape must be available locally, i.e. the location contained in the catalog entry field TEMPORARY-LOCATION must not possess the attribute TYPE=REMOTE in the location table.
- The tape must not currently be in use on another system (the check as to whether the tape is currently in use on the local system is performed by BS2000, not by MAREN).
- If the tape is to be used for input operations, the file names in the MAREN catalog entry and in the TFT must match. The catalog ID, user ID and version are ignored. This check is not carried out if the volume is accessed via ARCHIVE.

updating of archive entries

The following catalog entry fields in the relevant catalog entry are updated when a tape is processed:

LAST-ACCESS-DATE
LAST-ACCESS-TIME
LAST-ACCESS-JOB-NAME
LAST-ACCESS-USER-ID
LAST-ACCESS-ACCOUNT
LAST-ACCESS-HOSTNAME
LAST-ACCESS-TSN
LAST-ACCESS-SNO
LAST-ACCESS-FUNCTION-NAME
LAST-ACCESS-FUNCTION-FLAG
CHECK-COUNT
DEVICE-TYPE
TEMPORARY-LOCATION *(only for locations with operating mode MANUAL)*
ACCESS-COUNT
OPEN-MODE
DEVICE-NAME

In the case of OUTPUT, the following catalog entry fields are also updated:

```
CREATION-DATE
CREATION-TIME
CREATION-JOB-NAME
FIRST-VOLUME
VOLUME-SEQUENCE
FILE-NAME
CREATION-CATALOG-ID
CREATION-USER-ID
CLOSE-INDICATOR
LAST-CLOSE-DATE
LAST-CLOSE-TIME
INITIALIZATION
EXPIRATION-DATE
FREE-DATE    (only if smaller than EXPIRATION-DATE)
```

In the case of an HSMS/ARCHIVE backup, the following catalog entry fields are also updated:

```
DIRECTORY-NAME    (only when saved with directory)
SAVE-FILE, SUBSAVE/SEQ, REQUEST-NAME (when saved with HSMS)
```

Outputting transport messages

If the tape is not yet located on the system (i.e. TEMPORARY-LOCATION is not equal to the local system name), the transport message `MAR4164` is output to the console. This message includes information on the current location of the tape.

No transport messages are issued for tapes in whose catalog entries the location of an archive system (operating mode “ROBAR-1” or “ROBAR-2”) or an external location (operating mode “EXTERNAL”) is entered as the TEMPORARY-LOCATION.

Using the DEVICE parameter

When processing input tapes archived in the MAREN catalog, the user can omit specification of the otherwise mandatory DEVICE parameter (see the MAREN parameter DEVICE-COMPLETION).

Determining the archive number for a tape file

When MAREN is used, the archive numbers of tape files that were not cataloged in TSOSCAT can be determined automatically,

One of the following requirements must be met to permit this:

- The tape file concerned is processed further on the system on which it was created
- Both systems, i.e. both the system on which the tape file was created and also the system on which it is to be further processed, are interconnected in the same MAREN catalog.

If either of these conditions is met, which is usually the case when a tape file is further processed in the same data center, the information required for the file assignment concerning the tapes to be used and their device type is located in the MAREN catalog and can be called from there.

It is thus no longer necessary for the user to specify the archive numbers and their device type. The file assignment may looks like this, for instance:
`/IMPORT-FILE SUPPORT=TAPE(VOLUME=*ANY,DEVICE-TYPE=*ANY,FILE-NAME=TAPE.FILE)`

BS2000 (DMS) passes the file name on to MAREN. If the MAREN catalog contains entries with this name, MAREN returns the archive number and device type of the tapes marked in these MAREN catalog entries to DMS (“volume substitution”). Using the information received from MAREN, DMS can complete the file assignment and request the required tapes.

One problem that may arise in connection with volume substitution is that the same file name, e.g. TAPE.FILE, may occur more than once in the MAREN catalog. This is the case if the same tape file was created at different times and using different tapes, and if the relevant tapes in the MAREN catalog have not yet been released. These individual versions of a file are not distinguished by the file name, as is the case with file generations, for example. By default, MAREN can select the latest (youngest) file version. However, it must also be possible to select a specific older file version.

Another potential problem lies in the fact that tape files cannot always be uniquely assigned to user IDs. This means that there may be several entries in the file catalog (TSOSCAT) for the same tape file in the BS2000.

For this reason, DMS only stores the max. 41-character file name without the user ID in the tape labels (HDR3 label) and, for the same reasons, the tape file names are not given user IDs in the MAREN catalog.

Volume substitution encounters problems at the latest when the file name involved has several entries in the MAREN catalog and the associated tape files were created under different user IDs. Selection based on the file version does not always provide a solution

here, as the different tape files with the same name may easily refer to files with completely different contents (e.g. file $A.XY contains inventory data, and file $B.XY contains personnel data).

File version and user ID selection

The command ADD-MAREN-FILE-ENTRY selects a specific file version, taking into account the user ID.

The VERSION operand in this command is used in volume substitution to define which file version in the MAREN catalog is accessed in a subsequent IMPORT-FILE command (with VOLUME=*ANY) and thereby to determine which archive numbers are required for processing.

The USER-IDENTIFICATION operand is used when determining these archive numbers to specify whether only MAREN catalog entries of the user's own ID or of foreign IDs are to be evaluated or if selection is not to be based on user IDs (a detailed description of the commands for processing MAREN-TFT can be found in the "MAREN user manual" [1]).

5 MAREN network and domains

A MAREN network consists of all the BS2000 systems which access the same (central) MAREN catalog. To permit this, appropriate communication connections must be configured and enabled by BS2000 systems support. The software product HIPLEX MSCF is required (see the “HIPLEX MSCF” manual [12]).

The MAREN administrator sets up and manages the MAREN network.

When domains are used, the MAREN network is split into different groups.

5.1 MAREN in a multiprocessor configuration

To ensure maximum availability of MAREN in a multiprocessor configuration with joint resources, access to the MAREN catalog must be possible from all systems at any time. The MAREN catalog must therefore be installed on a shared pubset and accessible via RFA. All systems which are intended for a MAREN network, in other words which jointly access the same MAREN catalog, must be interconnected via HIPLEX MSCF. In the event of the master failing, another system (backup master) automatically assumes the role of master and continues running the MAREN applications without interruption.

Prerequisites

1. HIPLEX MSCF must be installed and started under TSOS on all systems which jointly access the same MAREN catalog. The system involved must be interlinked via an MSCF connection. This can take place either statically with the MSCF parameter file or dynamically using the following command:
   `/START-MSCF-CONNECTION PARTNER-NAME=<system name>,CLOSELY-COUPLED`
2. The pubset containing the shared MAREN catalog must be entered as a shared pubset in the MRSCAT of the systems involved:
   `/ADD-MASTER-CATALOG-ENTRY ENTRY=<spvs-catid>,SHARED-PUBSET=*YES`

3. The master and backup master must be defined for the shared pubset:
   ```
   /SET-PUBSET-ATTRIBUTES PUBSET=<spvs-catid>,MASTER=<master-sysid>,
                          BACKUP-MASTER=<backup-sysid>,ALTERNATE-BACKUP=*BY-SHARER
   ```
   The shared pubset is imported into the master:
   ```
   /IMPORT-PUBSET PUBSET=<spvs-catid>,USE=*SHARE,SHARER-TYPE=*MASTER
   ```
   and into all the other systems (i.e. slaves):
   ```
   /IMPORT-PUBSET PUBSET=<spvs-catid>,USE=*SHARE,SHARER-TYPE=*SLAVE
   ```
4. The user ID SYSMAREN must be set up on the home pubset of all systems that have access to the MAREN catalog. By default, the catalog ID of the respective home pubset is entered:
   ```
   /ADD-USER USER-ID=SYSMAREN,...PUBSET=*HOME,DEF-PUBSET=*HOME
   ```
5. The user ID SYSMAREN must be set up on the shared pubset. By default, the catalog ID of the respective home pubset is entered:
   ```
   /ADD-USER USER-ID=SYSMAREN,PUBSET=<spvs-catid>,DEF-PUBSET=*HOME
   ```
   If the SYSMAREN user ID has different access privileges on the master than on the local system, the account number and the password for the master must be specified when calling the MARENCP enter file. They are needed to establish the RFA connection to the shared pubset with the MAREN catalog.
6. The MAREN catalog must be created or installed on the shared pubset under the user ID SYSMAREN.
7. The MARENLIB facility (for using MAREN exits) and the MAREN program files must be installed on the home pubset of all systems that have access to the MAREN catalog. This is because the source and target user IDs must match for an RFA connection to a shared pubset.
8. On slave systems, direct access to the MAREN catalog via MARENADM is possible only under the user ID SYSMAREN. This is because the source and target user IDs must match a user ID on the shared pubset for an RFA connection. Access to the MAREN catalog by other user IDs is handled via the MARENCP task.

The systems of the MAREN network are then interconnected and exchange messages and signals via HIPLEX MSCF.

If the master of the shared pubset fails, the “backup master” automatically assumes the role of master. Within the MARENCP task, the RFA connection to the shared pubset is restored on all systems and MARENCP is restarted.

5.2 MAREN network

MAREN must be installed and configured on all systems which are intended for a MAREN network. The following MAREN components must be started:

- MAREN subsystem
- MARENCP control program
- automatic free tape allocation facility MARENUCP

Further MAREN components can be started on the systems involved:

- MARENADM and MARENEKM administrator programs
- MAREN user program
- MARENLM utility routine

Setting up and managing a MAREN network

The MAREN administrator uses the MARENADM statement MODIFY-GLOBAL-PARAMETERS to define the global MAREN parameters of a MAREN network. They are displayed using SHOW-GLOBAL-PARAMETERS.

The MAREN administrator sets up a MAREN network by adding the systems intended for the MAREN network using the MARENADM statement ADD-HOST. When domains are used the system is assigned to a domain. The system-specific parameters of a system specified in the statement are adopted. They can be modified later using the MODIFY-MAREN-PARAMETERS statement.

When domains are used, a system must be added to the MAREN network before MARENCP can be started on this system. Without domains a system can also be added implicitly to the network by MARENCP being started on the system. The system-specific MAREN parameters are generated for the new system. They can be modified later using the MODIFY-MAREN-PARAMETERS statement.

The SHOW-MAREN-STATUS statement provides an overview of the current status of MAREN, and also of all systems connected in the MAREN network.

REMOVE-HOST enables the MAREN administrator to remove systems from the MAREN network.

Communication in the MAREN network

Particular runtime parameters influence the way in which MAREN works. The administrator makes modifications to the runtime parameters on his/her system and enters them in the MAREN catalog. When the MAREN components of the other systems access the MAREN catalog, they take over the modified parameters (see the section “Effectiveness of modifications to parameters” on page 31).

Whether and when these changes of status take effect on the other systems in the MAREN network depends on the status of the MAREN administrator system’s communication connections with the other systems in the MAREN network. If the MSCF network is not fully configured, status changes will only become effective on the “connected” systems.

In addition to modifying parameters, the MAREN administrator can also use some MARENADM statements to cause a change of status, for example closing or opening the files in the MAREN catalog, or switching the logging file.

The MAREN administrator uses the HOST-NAME operand of the following MARENADM statements to define whether a change of status is to apply on his/her system or (also) on other systems in the MAREN network:

MARENADM statement	**Meaning**
CHANGE-LOGGING-FILE	Switches the logging file on one or more systems
CLOSE-MAREN-FILES	Closes and locks the files in the MAREN catalog for one or more systems
OPEN-MAREN-FILES	Opens and unlocks the files in the MAREN catalog for one or more systems
SHOW-MAREN-STATUS	Displays the current MAREN status of a ll systems in the MAREN network
STOP-CONTROL-PROGRAM	Terminates the control tasks on one or more systems

Basic procedure for cross-system administration tasks in MAREN

- The administrator uses the HOST-NAME operand of the MARENADM statements mentioned above to specify that these are also to be effective for systems other than his/her own. The administrator can specify one particular host or all systems. (When domains are used, the DA is restricted to the systems of his/her own domain.)
- MARENADM sends a message to all systems which the administrator has specified and waits for a reply.
- On the systems specified, the message is evaluated and the relevant activities are initiated.
- After the activities have been completed, their execution is reported to MARENADM on the requesting system. With some statements the feedback information only consists of an acknowledgment. With others, data is also transferred which is processed further by MARENADM.

5.3 Domains in a MAREN network

5.3.1 Domain concept

These systems of a MAREN network can be split into groups, which are called domains. A domain can be assigned any number of systems. A domain consists not only of the systems, but also of the tapes which are processed on these systems.

Domains represent a protection mechanism: Access to tapes is only possible within the domain involved. This applies on the one hand for accesses to data stored on the tapes. On the other hand it also applies for accesses to the MAREN catalog, in other words to the attributes of the tapes.

The use of domains is optional. The conditions and requirements in the data center determine whether it makes sense to structure the MAREN network with domains.

User roles

When domains are used, three roles with different authorizations exist:

- The MAREN user
  The statements of the MAREN user program are available to the MAREN users. Users work solely in their own domain. For the users it makes no difference whether they are working in a domain with one or a specific number of systems or in a MAREN network with the same systems.
- The Domain Administrator (DA)
  DAs are permitted to execute statements of the MARENADM administrator program within their own domain. They may not work in other domains.
- The All-Domain Administrator (ADA)
  ADAs administer the domains using special statements of the MARENADM administrator program. Furthermore they are permitted to perform DA tasks in all domains. To do this they can explicitly adopt the role of the DA. The default domain- and system-specific defaults then apply for the ADA.
  The ADA must have authorization to execute MARENADM statements on at least one system in the MAREN network.

The roles of ADA and DA are protected by passwords, see the MARENADM statements MODIFY-GLOBAL-PARAMETERS and MODIFY-MAREN-PARAMETERS.

In the MAREN manuals the term “MAREN administrator” is used to mean the following:

– Generic term for all users with administrator rights regardless of whether or not domains are used
– Administrator in the MAREN network without domains

The meaning is made clear by the context. When this is not the case the particular administrator roles are named explicitly: ADA, DA, administrator without domains.

Assignment of tapes to domains

A domain consists not only of the systems, but also of the tapes which are processed on these systems. The MAREN catalog contains this assignment of tapes to domains.

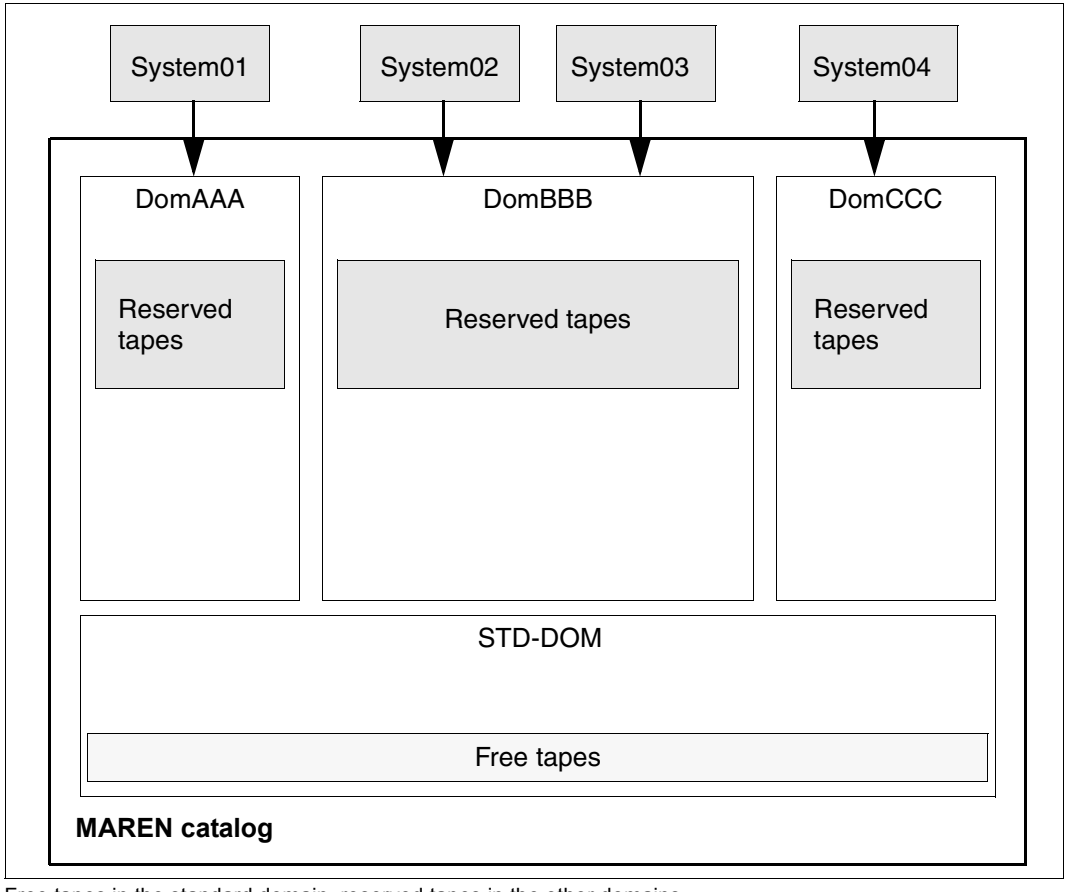
When a tape is reserved by a system and is, if required, being written to, it belongs to this system’s domain. The tape can then not be processed on the systems of the other domains. Nor is information about this tape visible in the MAREN catalog on the systems in the other domains.

In addition to the domains which are defined as a group of systems, there is also another domain, known as the standard domain (STD-DOM). Generally no systems belong to this domain, but the tapes which can be processed on all systems. These comprise:

- Free tapes which are available for all systems to reserve. (Free tapes can, however, also be assigned to a domain.)
- Reserved tapes which can be accessed by all systems.
- Tapes which were reserved in an earlier MAREN version and have not (yet) been assigned to a domain.

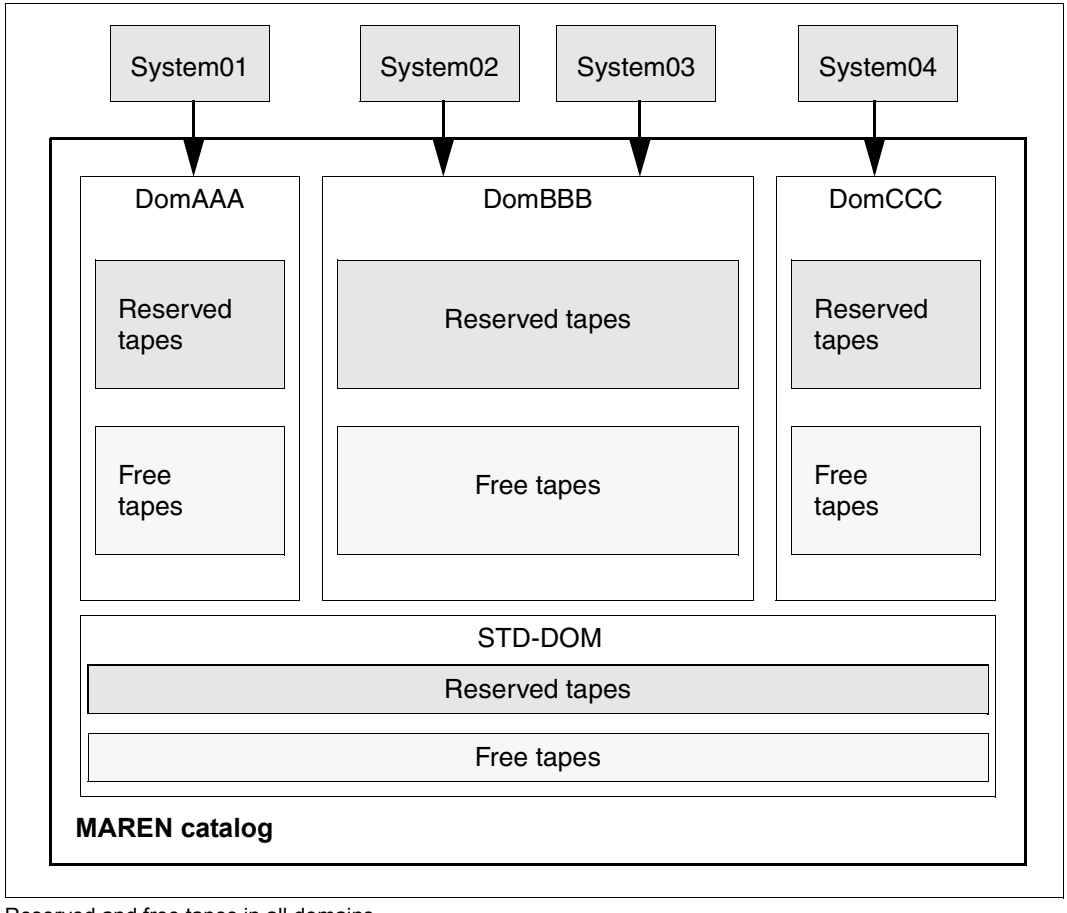
The following figures illustrate two typical applications of domains. They differ in the assignment of the reserved and free tapes to the standard domain and the other domains. For information please refer to the FREE-VOLUMES operand of the MODIFY-DOMAIN-PARAMETERS MARENADM statement.

Example 1: Free tapes in the standard domain, reserved tapes in the other domains



Free tapes in the standard domain, reserved tapes in the other domains

Example 2: Reserved and free tapes in all domains



Reserved and free tapes in all domains

Statements

Domains are set up and administered using MARENADM statements. Some statements are intended exclusively for use with domains. In other statements operands are available which are only meaningful when domains are used. These statements and operands largely concern all domains or one domain as a whole and are available to the All-Domain Administrator.

5.3.2 Setting up domains

The domains are set up in an existing MAREN network. For this purpose MAREN V12.0 and higher must be operating on all systems in the network.

Planning

Before domains are set up the following questions must be answered:

- Which systems of the MAREN network should be combined to form a domain? What should the domains be called?
- On which systems should the ADA work?
- Are all reserved tapes assigned to the specified domain or do some/all belong to the standard domain?
- Are all free tapes assigned to the standard domain or do some/all belong to other domains?

Example

A slightly modified form of the constellation in page 108 is taken as an example for this section:

– System01 forms the domain DomAAA
– System02 and System03 form the domain DomBBB
– System04 forms the domain DomCCC
– Reserved tapes always belong to the domains concerned. The free tapes belong to the standard domain. Only domain DomCCC is also to contain free tapes.

Procedure

Proceed as described below when you set up domains. Keep to the sequence of the steps. Use the MARENADM administrator program on the system on which the ADA is to continue working.

For the procedure described it is assumed that reserved and free tapes already exist in an existing MAREN network.

1. Enable operation with domains. You use the following statement here:
   ```
   //MODIFY-GLOBAL-PARAMETERS DOMAIN-PROTECTION=*ACTIVE
   ```
2. Restart the MARENCP, MARENUCP and MARENADM programs on all the systems.

   After these two steps MAREN distinguishes between Domain Administrators (DAs) and All-Domain Administrators (ADAs). Here the ADA can initially enter statements on all systems in the MAREN network.
3. Define domains and assign systems to the domains.

   The MODIFY-DOMAIN-ASSIGNMENT statement assigns a system to a domain. At the same time a new domain is defined if the name of a domain which does not currently exist is specified.

   Example

   The domains DomAAA, DomBBB and DomCCC are defined with the statements below. At the same time the systems System01, System02, System03 and System04 are assigned to the relevant domains:
   ```
   //MODIFY-DOMAIN-ASSIGNMENT HOST=System01,NEW-DOMAIN=DomAAA
   //MODIFY-DOMAIN-ASSIGNMENT HOST=System02,NEW-DOMAIN=DomBBB
   //MODIFY-DOMAIN-ASSIGNMENT HOST=System03,NEW-DOMAIN=DomBBB
   //MODIFY-DOMAIN-ASSIGNMENT HOST=System04,NEW-DOMAIN=DomCCC
   ```

   The MODIFY-DOMAIN-ASSIGNMENT statement can also be used to assign a system which already belongs to one domain to another (“new”) domain.
4. Release selected systems for the All-Domain Administrator (ADA).

   The ALL-DOMAIN-ADMIN and HOST operands in the MODIFY-MAREN-PARAMETERS statement determine the systems on which the ADA may work. Either individual systems or all systems in a domain can be specified here. As soon as (at least) one system has been released for the ADA, the ADA can no longer work on systems which have not been explicitly released for him/her.

   The subsequent MODIFY-GLOBAL-PARAMETERS statement with the ALL-DOMAIN-ADM-PASSW operand defines whether the ADA must legitimate himself/herself with a password.

   Example

   The ADA works on all systems of the domain DomBBB:
   ```
   //MODIFY-MAREN-PARAMETERS HOST=*ALL-FROM-DOMAIN(DOMAIN=DomBBB),
       ALL-DOMAIN-ADMIN=*ALLOWED
   ```

   The password for the ADA is: A4M
   ```
   //MODIFY-GLOBAL-PARAMETERS ALL-DOMAIN-ADM-PASSW=A4M
   ```

5. Legitimate yourself and log on as the ADA.

   To do this the administrator quits MARENADM with the HOLD-PROGRAM statement, enters the ADA password in BS2000 with the ADD-PASSWORD command and returns to MARENADM using the RESUME-PROGRAM command. You then log on as the ADA with the MODIFY-ADMINISTRATION-SCOPE DOMAIN=*ALL statement.

6. Assign reserved tapes to domains (optional).

   After the domains have been defined, all previously reserved (and the free) tapes belong to the standard domain. Using the MODIFY-VOLUME-ATTRIBUTES statement (VOLUME= and SELECT=*RESERVED operands) the ADA assigns reserved tapes to another domain.

   Example

   For this example it is assumed that a file exists for each domain which contains the tapes which are to be assigned to the domain (cf. INPUT-FILE operand in the MODIFY-VOLUME-ATTRIBUTES statement). For the domain DomAAA this is the file VOLAAA, for DomBBB the file VOLBBB, and for DomCCC the file VOLCCC. (Naturally the tapes can also be selected in a different way.) The ADA then assigns the reserved tapes to the domains using the following statements:

```
//MODIFY-VOLUME-ATTRIBUTES VOLUME=*BY-INPUT-FILE(FILENAME=VOLAAA),
    SELECT=*RESERVED(NEW-DOMAIN=DomAAA)
//MODIFY-VOLUME-ATTRIBUTES VOLUME=*BY-INPUT-FILE(FILENAME=VOLBBB),
    SELECT=*RESERVED(NEW-DOMAIN=DomBBB)
//MODIFY-VOLUME-ATTRIBUTES VOLUME=*BY-INPUT-FILE(FILENAME=VOLCCC),
    SELECT=*RESERVED(NEW-DOMAIN=DomCCC)
```

7. Assign free tapes to domains (optional).

   Free tapes normally belong to the standard domain. Using the MODIFY-VOLUME-ATTRIBUTES statement (VOLUME and SELECT=*FREE operands) the ADA assigns free tapes to another domain.

   Using the subsequent MODIFY-DOMAIN-PARAMETERS statement (DOMAIN and FREE-VOLUMES=*FROM-OWN-DOMAIN operands) the ADA defines that these free tapes will be used for future reservations. This definition is also effective for the release and initialization of tapes. Thus the release or initialization of tapes results in them either being put in the standard domain or remaining in their own domain.

Example

For this example it is assumed that free tapes with the numbers V001 through V199 exist in the standard domain. The ADA now assigns these to the domain DomCCC:

```
//MODIFY-VOLUME-ATTRIBUTES VOLUME=*INTERVALL(*FIRST=V001,TO=V199),
    SELECT=*FREE(NEW-DOMAIN=DomCCC)
```

Subsequently the ADA defines that these free tapes can only be used in the domain DomCCC:

```
//MODIFY-DOMAIN-PARAMETERS DOMAIN=DomCCC,FREE-VOLUMES=*FROM-OWN-DOMAIN
```

5.3.3 Administering domains

This section provides an overview of typical tasks that arise when working in a MAREN network with domains.

Changing administration areas

The administrative tasks in a MAREN network with domains are shared between All-Domain Administrators (ADAs) and Domain Administrators (DAs). A DA can switch to the role of the ADA and vice versa. The DA and ADA must always be authorized to work with the MARENADM program (see chapter “MARENADM administrator program” on page 219).

DA becomes an ADA

DAs can only switch to the role of the ADA if they are working on a system which is authorized for the ADA (see step 4 on page 111). A DA proceeds as follows:

- Quit MARENADM:
  `//HOLD-PROGRAM`
- Enter the ADA password in BS2000:
  `/ADD-PASSWORD PASSWORD=<password>`
- Return to MARENADM:
  `/RESUME-PROGRAM`
- Log on as ADA:
  `//MODIFY-ADMINISTRATION-SCOPE DOMAIN=*ALL`

If the ADA role is not password-protected, the last step alone is sufficient.

ADA becomes a DA

If the ADA takes over the role of the DA of a domain, he/she switches to the relevant domain. In this case he/she selects a system whose system-specific parameters apply for his/her other statements.

The ADA switches to the domain:
```
//MODIFY-ADMINISTRATION-SCOPE DOMAIN=<dom>(HOST=<system>)
```

This statement is also required if the ADA is already working on a system in the domain which he/she wants to administer as the DA. In this case the ADA enters DOMAIN=*OWN. It is not necessary to specify a host (HOST=) as the system-specific parameters of the user's own host will become effective.

Modifying the assignment of tapes to domains

Only the ADA is authorized to assign tapes to another domain. This is done using the MODIFY-VOLUME-ATTRIBUTES statement with the SELECT operand.

Example

The ADA now assigns all reserved tapes of domain DomAAA to domain DomCCC:
```
//MODIFY-VOLUME-ATTRIBUTES SELECT=*RESERVED(DOMAIN=DomAAA,NEW-DOMAIN=DomCCC)
```

Adding new systems to a domain

Only the ADA is authorized to add a new system to the MAREN network and in the process to a domain. The ADD-HOST statement is used for this purpose. Using the PARAMETER= operand the ADA defines the other system from which the system-specific parameters are taken over. Naturally these parameters can subsequently be modified. Only when the system is assigned to the network and a domain can MARENCP be started on this system.

Example

System System05 is assigned to domain DomBBB:
```
//ADD-HOST HOST=System05,DOMAIN=DomBBB
```

Assigning a system to another domain

Only the ADA is authorized to assign a system to another domain. The MODIFY-DOMAIN-ASSIGNMENT statement is used for this purpose.

Example

The ADA assigns the system System02 to domain DomCCC:
```
//MODIFY-DOMAIN-ASSIGNMENT HOST=System02,NEW-DOMAIN=DomCCC
```

5.3.4 Removing domains

Removing individual domains from the network

An individual domain is removed from the MAREN network by assigning all systems and tapes of the domain to another domain:

- If the domain uses its own free tapes, the ADA first of all disables their use:
  `//MODIFY-DOMAIN-PARAMETERS DOMAIN=<dom>,FREE-VOLUMES=*FROM-STD-DOMAIN`
- Subsequently the ADA assigns the domain's tapes to another domain. The ADA can do this for free and reserved tapes at the same time if the volumes are only to be assigned to one other domain, e.g. the standard domain:
  ```
  //MODIFY-VOLUME-ATTRIBUTES VOLUMES=*ALL,
      SELECT=*ALL(FROM-DOMAIN=<dom>,NEW-DOMAIN=*STD-DOMAIN)
  ```
  However, the ADA can also assign free and reserved tapes to various domains by using first SELECT=*FREE(...) and then SELECT=*RESERVED(...).
- Finally the ADA assigns all systems of the domain to other domains:
  `//MODIFY-DOMAIN-ASSIGNMENT HOST=<system>,NEW-DOMAIN=<ndom>`
- Alternately the ADA can also completely remove some or all system sin the domain from the MAREN catalog by entering the following for each system:
  `//REMOVE-HOST HOST=<system>`

Temporarily disabling working with domains

Working with domains can be temporarily disabled without the assignment of systems or tapes to domains being changed. This is practical if, for example, the use of domains is to be replanned but MAREN must continue to operate. To do this the ADA enters the following statement:

```
//MODIFY-GLOBAL-PARAMETERS DOMAIN-PROTECTION=*NON-ACTIVE
```

While working with domains is disabled, free tapes are taken exclusively from the standard domain. Sufficient free tapes must therefore be available in the standard domain.

Working with domains can be enabled again later. The assignments of the systems and tapes to the domains are retained provided they have not been explicitly changed in the MAREN catalog in the meantime.

Permanently disabling working with domains

If working with domains is to be permanently disabled, the ADA assigns all systems and tapes of the network to the standard domain and then disables the domains. In detail:

- The ADA disables the use of free tapes in all domains which have these:
  `//MODIFY-DOMAIN-PARAMETERS DOMAIN=<dom>,FREE-VOLUMES=*FROM-STD-DOMAIN`
- The ADA assigns the tapes of all domains to the standard domain:
  ```
  //MODIFY-VOLUME-ATTRIBUTES VOLUMES=*ALL,
      SELECT=*ALL(FROM-DOMAIN=*ANY,NEW-DOMAIN=*STD-DOMAIN)
  ```
- The ADA assigns all systems in the network to the standard domain by entering the following for each system:
  `//MODIFY-DOMAIN-ASSIGNMENT HOST=<system>,NEW-DOMAIN=*STD-DOMAIN`
- The ADA disables working with domains:
  `//MODIFY-GLOBAL-PARAMETERS DOMAIN-PROTECTION=*NON-ACTIVE`

6 Managing locations

In BS2000, locations can be assigned to tapes and the tape devices on which they are to be mounted.

The use of assigned locations enables the MAREN user to reserve tapes and the tape devices from a predefined set.

Locations must be defined for archive systems and can be defined for manual devices.

The names of the device depots installed in BS2000 using the ADD-DEVICE-DEPOT command must match the names of the locations in MAREN.

A tape from a specific location is selected either by naming the location explicitly in the tape request, through the default mechanism, through a reservation file, or through a MAREN exit.

6.1 Defining a location

“Location” is understood to include:

- a central archive, identified by means of the name “CENTRAL”
- a system as the processing location. No entry in the location table is required in this case and can be omitted.
- miscellaneous locations (e.g. archive systems or special archives), identified by means of freely selectable names such as “TRESOR”, “BRAND”.

Exported tapes are identified by means of an export date; they are given the temporary location “CENTRAL”, since they are usually exported via the central archive. The actual location of the exported tapes can be stored in the EXPORT-ADDRESS field of the catalog entry.

Operating mode for locations

In addition to manually operated locations, MAREN also supports storage locations served by archive systems (see chapter “MAREN and archive systems” on page 183). To enable MAREN to detect whether it should send its jobs to the console or to an archive system via ROBAR, an “operating mode” must be allocated to the location:

MANUAL	location to be operated manually
ROBAR-1	for archive systems from Quantum Corp.
ROBAR-2	for the archive system ETERNUS CS HE from FUJITSU
EXTERNAL	for a location of a group of tapes. The group is, for example, set up in a separate archive that is to be operated manually. The tapes in this archive should be processed only on the tape devices located there and not be mixed with tapes from other archives.

The administrator defines the operating mode with the MODIFY-MAREN-PARAMETERS statement, OPERATING-MODE operand.

Location identification

Locations are defined in the system-specific MAREN parameters, see section “Setting MAREN parameters” on page 31.

Each location is identified by the following:

- its name (a maximum of 8 characters; permitted characters: A..Z, 0..9 and the special characters $, # and @)
- its type (REMOTE or LOCAL)
- its mode of operation (manual or operated through an archive system, see above)

Location table

A location table exists for each system. The location table belongs to the system-specific parameters. It is therefore processed using the MARENADM statement MODIFY-MAREN-PARAMETERS.

The location called “CENTRAL” is always included in the location table.

In the MAREN system, 24 different locations can be managed. The locations are stored in the table with their name, symbolic name and type, and their operating mode.

The default value for the location is defined by the DEFAULT-HOME-LOCATION operand in the MARENADM statement MODIFY-MAREN-PARAMETERS.

The MARENADM statement SHOW-MAREN-PARAMETERS outputs information on the location table.

Any number of locations beyond the 24 contained in the location table are supported. These locations are, however, subject to certain restrictions.

1. These locations cannot be accessed via symbolic location names.
   Effects: none.
2. The location ID LOCAL is always assumed for these locations.
   Effects: processing of tapes from these locations can never be aborted with the error message `MAR4125`.

   This restriction is of no importance if all remote locations (e.g. fireproof cellar) are entered in the location table.

6.2 Creating a new location

6.2.1 Procedure

Before the tapes and tape devices can be accessed via their locations, various preparatory steps must be carried out. Only after the preparatory steps can the tapes be mounted without conflicts and can it be guaranteed that BS2000 and MAREN will operate smoothly together.

Adding a location to the location table

If a system is to access a new location, the new location must be added to the systems's location table using the MARENADM statement MODIFY-MAREN-PARAMETERS.

Under VM2000 or in configurations with multiple systems which access shared devices and tapes, the devices should be assigned to the same device depots.

Assignment of tape to location

The tapes are allocated to the locations via their archive numbers using the MARENADM statement MODIFY-VOLUME-ATTRIBUTES. Depending on their use, tapes can reside in three types of location:

- HOME-LOCATION = <location-name>
  Location at which the tape is usually stored.
- FREE-LOCATION = <location-name>
  Location where the tape is to be relocated when it is transferred to the pool of free tapes after the reservation period has elapsed.
- TEMPORARY-LOCATION = <location-name>
  Current location of the tape.

The three location names are stored by MAREN as catalog entry fields in the MAREN catalog. The MARENADM statement SHOW-VOLUME-ATTRIBUTES outputs information on the locations assigned to the tape.

Assignment of tape devices to location

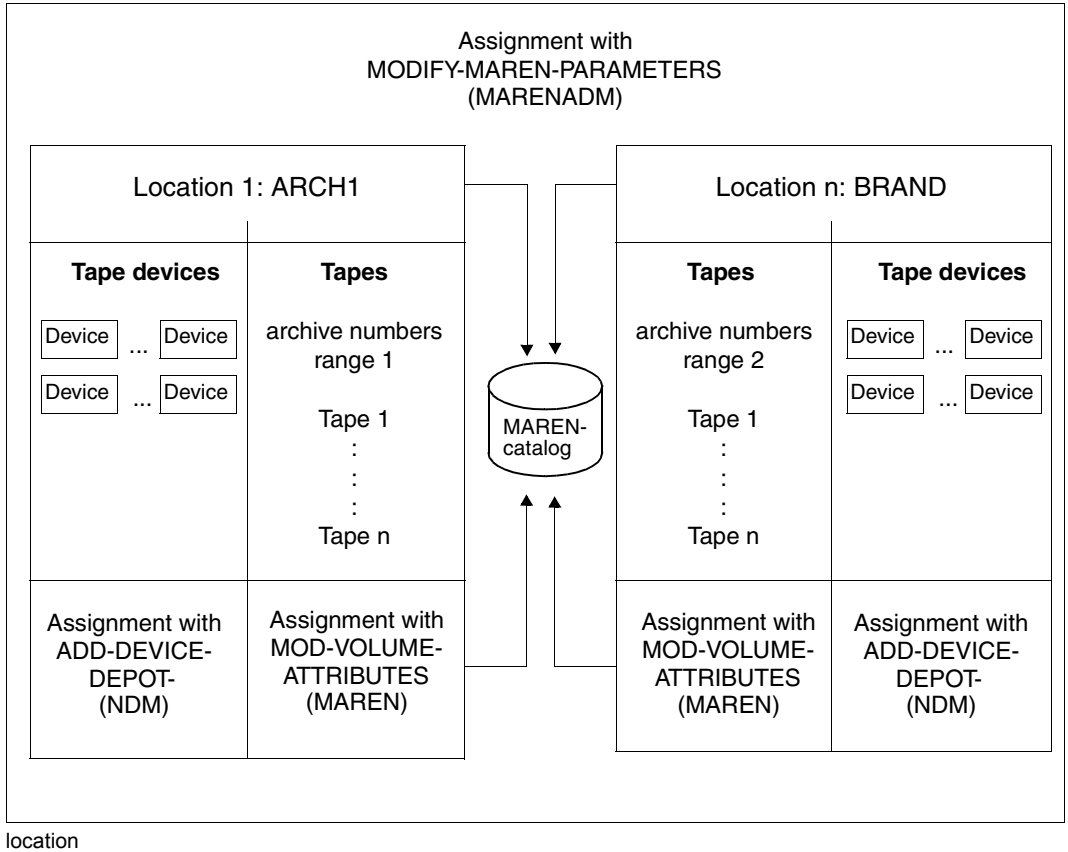
The ADD-DEVICE-DEPOT command informs the BS2000 NDM of the assignment of the tape devices to the locations. The name of the location must be the same as the location name defined in MAREN.

Device depots must be created using the command ADD-DEVICE-DEPOT each time a BS2000 system is booted.

The SHOW-DEVICE-DEPOT command outputs information on the assignments of tape devices to locations; the REMOVE-DEVICE-DEPOT command cancels the assignments.

When an archive system is used, the mount/dismount specifications should define that tapes are mandatorily unloaded:

```
/MODIFY-MOUNT-PARAMETER
        UNLOAD-RELEASED-TAPE=*REGARDLESS-OF-USER-REQUEST(TAPE-FAMILY=*MBK)
```



location

6.2.2 Example of location creation

A location with the name CENTSTOR is to be created for the archive system ETERNUS CS HE. Devices HI, HJ, HG, HH, T4 and T5 and the tapes from the archive number range MT2240 through MT2249 are to be assigned to this location.

The MARENADM administrator program is called. The MARENADM administrator adds the new location CENTSTOR to the MARENADM location table. The location is in the local data center (default TYPE=*LOCAL); its symbolic name is also CENTSTOR (default SYMBOLIC-NAME=*SAME):

```
/START-MARENADM

//MODIFY-MAREN-PARAMETERS LOCATION-ENTRIES=
    *PARAMETERS(LOCATION-NAME=CENTSTOR,ACTION=*ADD(OPERATING-MODE=ROBAR-2))
```

Outputting the MAREN parameters:

```
//SHOW-MAREN-PARAMETERS
HOST-NAME = D017ZE22  DOMAIN    = DOM17     SNO = 209

EXP-PROC     = Y     INPUT-F-CH = N       FOREIGN-T-CH = Y      TSOS-PRIV = N
EXP-FOREIGN  = N     INPUT-T-CH = Y       RETPD-CHECK  = Y      DEV-COMPL = N
EXP-ADDR-ACK = N     AUDIT      = YES     TEST-MODE    = N      LOGGING   = Y
EXP-RECEIPT  = FILE

BATCH-REQ-TIME=01800 DEF-FREE-DATE = 0000     ARCH-WORK-TIME = (00:00,24:00)
BATCH-EX-TIME =00100 DEF-HOME-LOC  = CENTRAL  PRIV-USER-ID   =
DIAL-REQ-TIME =00500 DEF-DEV-TYPE  = TAPE-U5  EXITS          =
DIAL-EX-TIME  =00500 DEF-USER-ACC  = OWNER-ONLY
CID-UID       = Y    DEF-ADM-SCOPE = *OWN     LAYOUT-FOR-SHOW= NORMAL
MOUNT-CH-INT  = 0060                          RESERVATION-SEQ= VSN
OVERRULE-LOC  = YES                           OPERATOR-ROLE  = SYSMAREN

MAREN-PASSWORD=NONE

RES-DEV-TYPES =(T6250   /TAPE-C4 /TAPE-C6 /TAPE-C5 /TAPE-C3 /TAPE-C2 )

%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)? Y
LOCATION-ENTRIES:(LOCATION-NAME,SYMBOLIC-NAME,TYPE,OPERATING-MODE)
  (CENTRAL ,CENTRAL ,LOCAL ,MANUAL  )    (CENTSTOR,CENTSTOR,LOCAL ,ROBAR-2 )
  (ROBABBA ,ROBABBA ,LOCAL ,ROBAR-1 )    (EXTERNAL,EXTERNAL,LOCAL ,EXTERNAL)
  (SECURE  ,SECURE  ,REMOTE,MANUAL  )    (         ,         ,      ,        )
  (        ,        ,      ,        )    (         ,         ,      ,        )
  (        ,        ,      ,        )    (         ,         ,      ,        )
%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)? N
```

The tapes are assigned to the CENTSTOR location via their archive number range (MT2240 through MT2249).

```
//MODIFY-VOLUME-ATTRIBUTES VOLUME=*INTERVAL(FROM=MB2240,TO=MB2249),
   LOCATION=*PARAMETERS(HOME-LOCATION=CENTSTOR,
   FREE-LOCATION=CENTSTOR,TEMPORARY-LOCATION=CENTSTOR)
%  MARM121 MAREN CATALOG ENTRY 'MB2240'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2241'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2242'/'0001' MODIFIED
. . .
%  MARM121 MARM121 'MB2249'/'0001' MODIFIED
%  MARM120 TOTAL OF 9 MAREN CATALOG ENTRIES PROCESSED
```

The MAREN catalog is output. Since a range of tapes has been specified, only the most important attributes are output for each tape.

```
//SHOW-VOLUME-ATTRIBUTES VOLUME=*INTERVAL(FROM=MB2240,TO=MB2249)
-------------------------------------------------------------------------------
VOLUME FSEQ DEV-TYPE USER-ID  ACCOUNT  RES-DATE FREE-DATE  HOME-LOC ACC# E FL
-------------------------------------------------------------------------------
MB2240 0001 TAPE-C4  SYSMAREN          <date>   <date>     CENTSTOR 0014   F
MB2241 0001 TAPE-C4  TSOS              <date>              CENTSTOR 0000   P
MB2242 0001 TAPE-C4  TSOS              <date>              CENTSTOR 0007   P
MB2243 0001 TAPE-C4  TSOS              <date>   <date>     CENTSTOR 0000   F
MB2244 0001 TAPE-C4  TSOS              <date>   <date>     CENTSTOR 0000   F
MB2246 0001 TAPE-C4  TSOS              <date>   <date>     CENTSTOR 0001   F
MB2247 0001 TAPE-C4  TSOS              <date>              CENTSTOR 0000   P
MB2248 0001 TAPE-C4  TSOS              <date>              CENTSTOR 0000   P
MB2249 0001 TAPE-C4  TSOS              <date>              CENTSTOR 0000   P
%  MARM120 TOTAL OF 9 MAREN CATALOG ENTRIES PROCESSED
```

MARENADM is terminated.

```
//END
% MARM198 MARENADM TERMINATED NORMALLY
```

This required devices are assigned to the location already defined in MAREN.

```
/ADD-DEVICE-DEPOT UNIT=(HI,HJ,HG,HH,T4,T5),LOCATION=CENTSTOR
```

And finally, the assignments of location, routing code and devices are output

```
/SHOW-DEVICE-DEPOT UNIT=*LOCATION(LOCATION=CENTSTOR)
%  LOCATION RTC TAPE-MNEMONICS
%  CENTSTOR  T  HI  ,HJ  ,HG  ,HH  ,T4 ,T5
```

6.2.3 Automatic location definition

MAREN must define a location when the following conditions are met:

- more than one location is being operated with tape processing in a data center (i.e. especially if manually operated devices are being used as well as an archive system)
- there are applications which neither explicitly nor implicitly (by specifying an archive number) specify the location.

MAREN allocates a location for the following applications:

a) Device reservation by means of the SECURE-RESOURCE-ALLOCATION command without explicit specification of a location

b) Device reservation for a scratch request

c) Free tape allocation by MAREN for a scratch request

Location definition without MAREN exits and reservation file

MAREN selects the first archive system entered in the location table. If there is no archive system in the table, MAREN uses the location specified in the system-specific MAREN parameter DEFAULT-HOME-LOC.

If this location assignment does not meet the requirements of the data center, because, for example, there are two tape locations to be used for handling scratch requests, the location definition must be controlled by a reservation file or MAREN exits.

Location definition with a reservation file

The location can be defined with a reservation file (see section “Location management via a reservation file” on page 126). The MAREN administrator creates and edits the reservation file using the MARENLM program (see section “Editing the reservation file with MARENLM” on page 134) or an editor.

Location definition using MAREN exits

Instead of defining the location via a reservation file or in addition to this, it is also possible to define the location via MAREN exits (see the chapter “MAREN exits” on page 199). In the applications (a) and (b) named above, the device depot exit MARENEX6 is used and in the application (c) the reserve request exit MARENEX1 is used.

In both exit routines, the location name can be input either directly or indirectly by specifying a number range.

The decisive criterion for direct or indirect specification of the location name in the exits can be the file name, the volume type, the job name, or the user ID.

When evaluating the volume type, note that MAREN transfers it in different formats to the exits. For example, when a tape of type TAPE-C4 is requested, MAREN transfers the volume type code “BC” to exit MARENEX1 in the 2-byte long DEVICE field and the volume type “TAPE-C4” to exit MARENEX6 in the 8-byte long DEVTYPE field (in USERFELD). The volume type codes can be found in the the manual “System Installation” [6].

For scratch requests, the location is determined twice (applications (a) and (b)). If a location is determined in one exit, the same location must also be determined in the other exit.

6.3 Location management via a reservation file

For reservations that have to be made with specific allocations (e.g. with specific locations or number ranges) MAREN uses a reservation file. This contains the data relevant for reservations. In the event of a reservation, MAREN compares the specified selection criteria (e.g. of the RESERVE-FREE-VOLUMES statement) with the criteria from the reservation file.

The MAREN administrator generates, edits and manages the reservation file via the menu interface of the MARENLM program. Alternately he/she can edit the reservation file with an editor.

In addition to a reservation file, the administrator can also use MAREN exits (see “Location definition using MAREN exits” on page 125).

Applications

A reservation file, for instance, can be used in the following situations:

- An existing archive system configuration is being extended, i.e. a second archive system is being added. The criteria which determine the archive system’s behavior when selecting free tapes need to be defined. If a reservation file or the MAREN exits are not used, any free tapes requested would always be selected from the same archive system.
- An existing archive system configuration is retained, but its use is being altered. New MAREN exits need to be programmed or the existing exits need to be reprogrammed extensively. A reservation file greatly facilitates the necessary modifications.

Beyond that, a reservation file also offers flexible location assignment features.

6.3.1 Format of the reservation file

The reservation file contains information on the features of the tapes needed when a tape is initially reserved. The following information can be stored in each record of the reservation file:

- location
- tape number range (start and end archive number)
- Device type
- User ID
- Jobname
- Reservation rejection
- utilization type (for a directory or a file)
- File name (directory or file)
- Free pool name (name of a free tape pool)
- Info

When a free tape is requested, the reservation file is read sequentially. When an entry is found that matches the comparison criteria, the read operation is terminated. This means that the order of the entries is important. A more detailed description is provided in the section “Evaluation of the reservation file” on page 131.

The entries in the reservation file have the following format (see also the figure “Structure of the MARENLM basic form” on page 136 and “Layout of the data edited for printing” on page 145). Each field of an entry is defined by its position.

- Location
  <alphanum 1..8> determines the location at which a tape or a device (in the case of SECURE-RESOURCE-ALLOCATION) is to be reserved.
  *ANY (or 8 blanks) in place of a location name means that the location is defined elsewhere:
  – The location specified explicitly or implicitly in the RESERVE-FREE-VOLUME statement applies.
  – Otherwise the location specified by the user with ADD-MAREN-FILE-ENTRY LOCATION= ... or via ARCHIVE or HSMS applies. If it has not been specified in this way, the location is defined as described under “Location definition without MAREN exits and reservation file” on page 124.

- Start VSN
  <alphanum 1..6> is the archive number of the first tape in a number range. A number range is defined by specifying another tape in the field “End VSN”.
- End VSN
  <alphanum 1..6> is the archive number of the last tape in the range of tapes.
  The start VSN and end VSN must both contain an archive number or blanks.
- Vol.type
  <alphanum 1..8> defines the type of the requested tape. This entry is evaluated by BS2000 NDM. The device type cannot be truncated (for example T-C4 may not be specified instead of TAPE-C4).
- Userid
  <alphanum 1..8 with-wild> defines the user identification of the task which issued the tape request.
  The user ID can be specified fully-qualified (without $) or partially-qualified (* at the end of the substring). Beginning with *, all following characters are treated as concordant.
- Jobname
  <alphanum 1..8 with-wild> defines the job name of the task which issued the tape request.
  The job name can be specified fully-qualified or partially-qualified (* at the end of the substring). Beginning with *, all following characters are treated as concordant. This field corresponds to the request name in HSMS statements.
- Rej.
  <alphanum 1..1> defines whether the request is rejected.
  With “R” the request is rejected.
  With “O” the operator is requested to specify an archive number.
  If this field contains a blank, the request is accepted.
- A/F
  <alphanum 1..1> defines whether a reservation is to be allocated to a directory (A) or to a file (F). If this field is not set, then the following Directory/Filename field will not be ignored, no matter what the content is.

- Directory/Filename (ARCHIVE Directory/Filename)
  <filename 1..54> defines a directory file if the tapes are requested with HSMS/ARCHIVE, or a file is to be created on specific tapes.

  Depending on the A/F field contents, a file name with catalog ID and user ID has to be specified for a directory file and a file name without catalog ID and user ID for a file.

  Whether the partially-qualified specification of Directory or Filename is possible also depends on A/F:

  – With A/F= A (HSMS/ARCHIVE application):
    The name of the directory file is a fully-qualified file name and is divided into CATID, USERID und FILENAME (e.g. :CATD:$SYSHSMS.DIRECTORYSYSBACKUP). The parts can be individually specified as partially-qualified (with * at the end) or they can be omitted.

    Possible specifications (examples) for CATID, USERID und FILENAME:

CATID	:ABC:	fully-qualified specification
	:A*:	partially-qualified specification: has to begin with A in this example (or only A)
	<empty>	will not be checked, i.e. always valid
USERID	$ABC	fully-qualified specification
	$A*.	partially-qualified specification: has to begin with A in this example (or only A)
	$.	must conform to the DEFLUID of the CLASS2OP
	<empty>	will not be checked, i.e. always valid
FILENAME	ABC	fully-qualified specification
	A*.	partially-qualified specification: has to begin with A in this example (or only A)
	<empty>	will not be checked, i.e. always valid

  – With A/F =F:
    The filename can be specified partially-qualified (* at the end). Beginning with *, all following characters are treated as concordant.

  The system -specific MAREN parameter CID-UID specifies whether the catalog ID and the user ID have to be specified for a file.

- Free-Pool-Name
  <alphanum 1..54> defines the free tape pool from which the tape requested is to be reserved. 54 blanks designate the free tape pool *NO.
- Info
  <alphanum 1..16> for user information.

The following table shows examples for the specification of partially-qualified values of the fields Userid, Jobname, Filename and Directory described above:

Field in reservation file	**Valid values**	**Invalid values**
Userid	USERID* *ANY <only blanks> * and rest with blanks	*ANYX *ANY x USER*DXX *A
Jobname	JOBNAMEX JOBNA* *ANY <only blanks> * and rest with blanks	*ANYX *ANY x JOB*XX *A
Filename	FILE.NAME FILE.NAME* FILE.* *ANY <only blanks> * and rest with blanks	FILE.NAME* A *ANY x FILE*XX *A
Directory	:X:$USER.DIR-NAME :XAB*:$USER*.DIR* :*:$USER.DIR-NAME* $USERID.DIR-NAME DIR-NAME :YAB:$.DIR-NAME :CATD:DIR-NAME	:ABCDX*:$USERID.DIR-NAME :CATD:$USER*XXX.DIR-NAME DIR-NAME* XXX :C*TD:$X...DIR-NAME :CAT:$*ABC.DIR-NAME

6.3.2 Evaluation of the reservation file

Prerequisite

The enter files of MARENCP and MARENUCP must be adapted to permit the reservation file to be evaluated.

The following line has to be inserted in the procedure files for starting the MARENCP and MARENUCP tasks before the control program call, i.e. before the line /START-MARENCP or /START-MARENUCP respectively:

```
/ADD-FILE-LINK LINK-NAME=MARENLMF,FILE-NAME=<lmf_name>
```

`<lmf_name>` Name of the reservation file which is to be used.

If the reservation file is not stored under the SYSMAREN user ID, the complete path name has to be specified and the file must have the attribute SHARE=YES. Otherwise the file cannot be found by MARENCP (the message `MARLM01` will be output and MARENCP will be terminated).

Evaluation procedure

When a free tape is requested, the entries in the reservation file are read sequentially.

For each entry the fields defined as comparison criteria are compared with the corresponding parameters of the tape request. Which fields are defined as comparison criteria is described below for the individual statements.

If a field contains blanks or *ANY, the comparison will be positive regardless of the value of the parameter.

As soon as an entry is found which matches all the comparison criteria, the following information is transferred from the entry to MARENCP and MARENUCP, where it is used for selecting the tape:

- location
- Number range
- Free-Pool-Name
- Reservation rejection

The read operation is terminated. No further entries in the reservation file are checked.

If no entry is found which matches all the comparison criteria, the tape request is rejected.

MARENADM statement RESERVE-FREE-VOLUME

MARENCP evaluates the reservation file using the RESERVE-FREE-VOLUME statement of the MAREN or MARENADM utility routine.

Comparison criteria:
– User ID
– File name
– Device type
– location
– Start of number range
– End of number range
– Free-Pool-Name

The comparison is negative in the following cases:
– If the reservation file entry contains an “A2 in the “Utilization type (A/F)2 field or the name of a directory.
– If the reservation file entry contains a value other than “*NO” in the “Free-Pool-Name” field.

HSMS/ARCHIVE statements

MARENCP evaluates the reservation file using the HSMS/ARCHIVE statements for tapes in the directory pool as well as the action statements requesting free tapes (save, archival, migration, export).

Comparison criteria:
– User ID
– directory
– Device type
– Start of number range
– End of number range
– Jobname

SECURE-RESOURCE-ALLOCATION command

The SECURE-RESOURCE-ALLOCATION command reserves system resources such as tapes and/or tape devices. MARENUCP evaluates the reservation file when this is done.

Comparison criteria:
– File name
– User ID
– Jobname
– Device type

If the reservation file entry contains a directory, the comparison is negative.

Scratch request

If a scratch request is received (i.e. a tape is requested but no archive number is specified), MARENUCP evaluates the following comparison criteria:

– File name
– User ID
– Jobname
– Device type
– Location (see next section)

Using a location specified by the user

The location of a tape is determined by the specifications in the reservation file when a reservation file is used.

A user can also specify a location in the MAREN statement RESERVE-FREE-VOLUME, in ARCHIVE, HSMS, or FDDRL. Up to and including MAREN V12.0, this specification was ignored.

In MAREN V12.5 and higher, the system-specific MAREN parameter OVERRULE-LOC decides on the further procedure:

– OVERRULE-LOC=REJECT
  The location specified by the user is employed (differing locations lead to the reservation being rejected).
– OVERRULE-LOC=YES
  The location specified in the reservation file is used.

6.3.3 Editing the reservation file with MARENLM

The MAREN administrator can process the reservation file with the MAREN Location Manager (MARENLM).

MARENLM does not check the validity of the values entered. The user is responsible for doing this.

MARENLM attempts to open the reservation file in “read/write” mode. If the file is write-protected, MARENLM accesses it in read-only mode. A corresponding message is issued. The reservation file is opened and the MARENLM primary mask appears containing the current data.

6.3.3.1 Starting and terminating of MARENLM

The MARENLM utility routine is loaded and started using the START-MARENLM command under a user ID with the TAPE-ADMINISTRATION privilege.

START-MARENLM	Alias: **MARENLM**
VERSION = ***STD** / <product-version mandatory-man-corr> / <product-version mandatory-man-without-corr> / <product-version without-man-corr> **,MONJV** = ***NONE** / <filename 1..54 without-gen-vers> **,CPU-LIMIT** = ***JOB-REST** / <integer 1..32767 *seconds*>	

VERSION =
The selected MARENLM version is used.

VERSION = *STD
Before MARENLM is called, the version is set using the SELECT-PRODUCT-VERSION command (in system mode). This set version is used as the default version.

VERSION = <product-version mandatory-man-corr>
Full version identifier.

VERSION = <product-version mandatory-man-without-corr>
Version identifier excluding the correction status.

VERSION = <product-version without-man-corr>
Version identifier excluding the release and correction status.

MONJV =
Specification of a job variable for monitoring the MARENLM run.

MONJV = *NONE
A monitor job variable is not used.

MONJV = <filename 1..54 without-gen-vers>
Explicit specification of the job variable for monitoring the MARENLM run.

CPU-LIMIT =
Maximum CPU time in seconds allocated for the program.

CPU-LIMIT = *JOB-REST
The remaining CPU time is to be used for the job.

CPU-LIMIT = <integer 1..32767 *seconds*>
Only the specified time is to be used.

When MARENLM is started, the MARENLM basic form appears. The reservation file can now be managed (File menu) or edited (using shortcut keys or the relevant control statements).

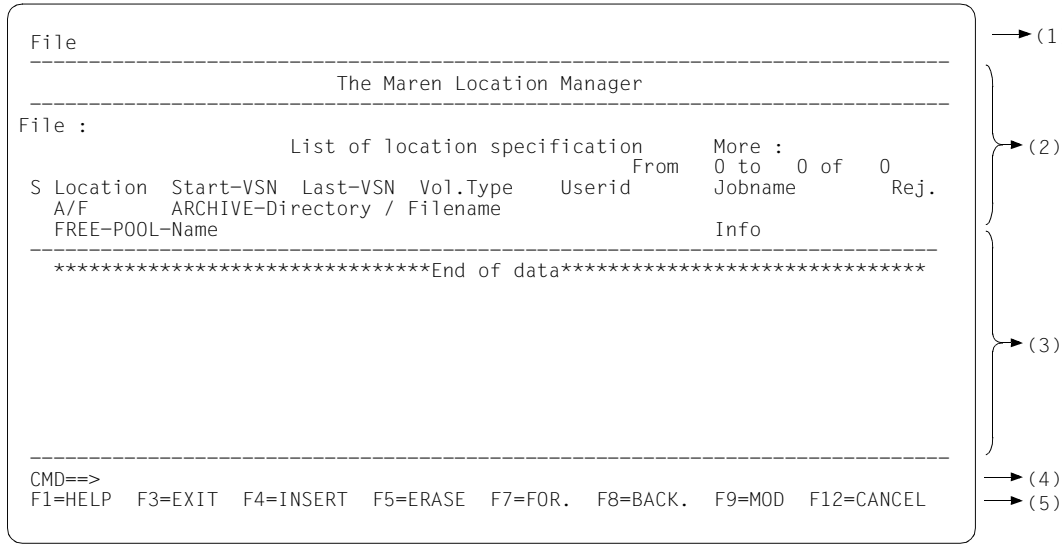
MARENLM can be terminated in the following four ways:

1. by selecting *Exit* from the *File* menu
2. by pressing the function key F3
3. by entering the control statement EXIT in the command line
4. by pressing the function key F12 in the basic form

When you terminate MARENLM an open reservation file, is only closed and **not saved**. Modifications have to be saved explicitly (see menu options *Save* and *Save as* in the *File* menu).

6.3.3.2 The MARENLM basic form

MARENLM uses FHS forms. The figure below shows the MARENLM basic form Refer to the “FHS” manual [11] for further details. The interface is language-dependent. The language of the user interface can be set for a task using the MODIFY-MSG-ATTRIBUTES command. The English user interface is described here:



Structure of the MARENLM basic form

Menu bar (1)

The menu bar contains the available menu titles. Each of which, in turn, contains a group of menu options that are displayed in a drop-down menu below the menu title. From the *File* menu in the MARENLM menu bar, you can select the functions required to manage the reservation file.

Status area (2)

The status area informations you of the form contents and names the reservation file that is currently open.

Work area (3)

The work area displays the entries in the open reservation file and/or prompts a user selection. This is where parameters are queried or messages issued. A maximum of 3 entries are displayed in the work area. If not all entries can be displayed in the work area, the user can page through the work area accordingly. Entries to be edited can be selected. The selection is made with “x”,”X”, “/”, “A” or “a” in first column (column heading “S”). “x”,

“X” or “/” selects an existing entry. The entry selected can then be changed or deleted using the function keys (or the relevant control statement in the command line). Positions for entering new entries can be selected with “x”,”X”, “/”, “a” or “A”.

If the entry is not selected, then the user cannot access the columns from “Location” to “FREE-POOL Name” (see page 146 and 147).

The end of the reservation file is indicated by the following line:

```
**********End of data**********
```

If no reservation file is open this line is displayed directly below the status area and no selection can be made in the work area. A new reservation file contains 3 “empty” entries which can be selected and edited.

Dialog boxes in which the parameters needed for an action are queried or in which messages are issued are also opened in the work area.

Command area (4)

The user can enter statements for interactive operations in the command line (see “Shortcut keys and control statements” on page 138).

Display area - key area (5)

The display area contains an overview of the current function key allocation.

Working with the MARENLM basic form

In the MARENLM basic form, menu options can be selected, commands can be issued using shortcut keys and control statements can be entered in the command area.

The functions pertaining to the management of the reservation file are all contained in the *File* menu in the menu bar.

You access the menu bar by pressing the cursor key POS 1 or HOME. In order to view the menu options, the selected menu title has to be confirmed with DUE.

Within the menu, the options are numbered (starting with 1). To select an option from the menu, its number must be entered in the field in front of the first menu option. Depending on the menu and on the processing status, the field may already contain an option number. Confirm your entry by pressing the DUE key.

If MARENLM requires further information in order to execute an action, a dialog box will be opened. You can enter the parameters MAREN needs in the dialog box. This manual contains a detailed description of the parameters following the function they belong to.

Messages

MARENLM messages are issued in a dialog box. To close the dialog box again, press the F3 or F12 key.

Error messages

If problems occur while a reservation file is being generated or opened, a DMS message is issued. A brief error description is output together with the four-character return code. If you require further information on the meaning of the return code, enter the following statement in the command line:

```
sys /help-msg DMS<dms-returncode>
```

When the complete error description has been displayed, you can return to MARENLM by pressing the DUE key.

Shortcut keys and control statements

The object of shortcut keys is to speed up the entry of standard actions. The command is executed when a specific function key is pressed. The key area displays the function key allocations for various standard situations.

Control statements can be entered in the command area. For further information on control statements refer to the manual “FHS” [11].

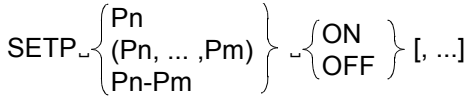
The table below contains the MARENLM shortcut keys (function keys) and the control statements they belong to. Alternatively to the function keys, control statements can be entered in the command area.

Key	Control statement	Meaning
F1	HELP	Calls context-sensitive help from FHS.
F3	EXIT	Terminates MARENLM, closes a dialog box.
F4	INSERT	Inserts a new entry in the reservation file. The function can only be used if you marked an entry before. If you mark an entry with “X” or “/” the new entry is inserted above the marked entry, if you use “A” to mark an entry, the new entry will be inserted below the one you marked.

Key	Control statement	Meaning
F5	ERASE	Deletes an entry from the reservation file. The function can only be used if you marked an entry before with “X” or “/”.
F7	FORWARD; +	Pages forward to the next page (3 entries).
	+n	Pages forward n entries.
	++	Pages forward to the end of the file.
F8	BACKWARD, -	Returns to the previous page (3 entries).
	-n	Pages back n entries.
	--	Pages back to the start of the file.
F9	MODIFY	Modifies an entry. The function can only be used if you marked an entry before with “X” or “/”.
F12	CANCEL	Cancels a function or selection, closes a dialog box. Terminates MARENLM when called from the basic menu.
K2	SYS	Switches to BS2000 command mode. The command is executed with SYS and when you press DUE, you return to the program mode. MARENLM is interrupted by pressing K2. You return to the program with the command RESUME-PROGRAM.
K3	RESHOW	Refreshes the screen contents. If the menu is displayed incompletely, e.g. after an interruption with K2, this command refreshes the screen.

If no function keys are available you can allocate functions to the P keys using the SETP control statement. This allocation with SETP is only valid in the current MARENLM session.

The SETP control function is entered as follows:



Operands

Pn	the P key with the number n
(Pn,..,Pm)	all P keys listed, Pn,..,Pm
(Pn-Pm)	the entire range of P keys, from Pn to Pm
ON	allocates the F key to the specified keys
OFF	cancels the allocation

The SETP operands can be specified several times. They have to be separated by a comma, as shown in the example below. The number of blanks surrounding each comma is irrelevant.

Example

```
SETP P1 ON, P2 OFF, (P3,P7,P8) ON, (P4-P6) OFF
```

This SETP control statement allocates the keys as follows:

```
P1 - F1, P3 - F3, P7 - F7, P8 - F8
```

The allocation of P2 and of P4, P5 and P6 was canceled.

6.3.3.3 The menu options of MARENLM

MARENLM is operated using the options of the *File* menu. The following menu options are available to manage the reservation file:

1. *New*
   Creates a new reservation file and opens it for processing.
2. *Open*
   Opens an existing reservation file for processing.
3. *Save*
   Saves the current processing status in the reservation file.
4. *Save as*
   Creates a backup copy of the reservation file that is currently open under a new file name.
5. *Print*
   Prints the contents of the reservation file to a file.
6. *Exit*
   Closes MARENLM.

File

␣ 1. New
2. Open
3. Save
4. Save as
5. Print
6. Exit

1 File: New

Option *1* (*New*) in the *File* menu is used to create a new reservation file and to open it for subsequent processing. The new file contains three “empty” entries, which are already selected for processing (i.e. the fields can be modified immediately).

The name of the new reservation file can be entered in the following dialog box.

```
File
 ..............................................................  ---------------
 :               Create a new reservation file                :
 : -----------------------------------------------------------  :  ---------------
 :                                                              :
 :       Enter the name of the new reservation file :           : :
 :                                                              :   0 of   0
 :    $sysmaren.lmf.file.1                                      : me         Rej.
 :                                                              :
 :                                                              :
 :                                                              :  --------------
 : -----------------------------------------------------------  :  *************
 : CMD==>                                                       :
 : F1=HELP  F3=EXIT  F12=CANCEL                                 :
 :..............................................................:




 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

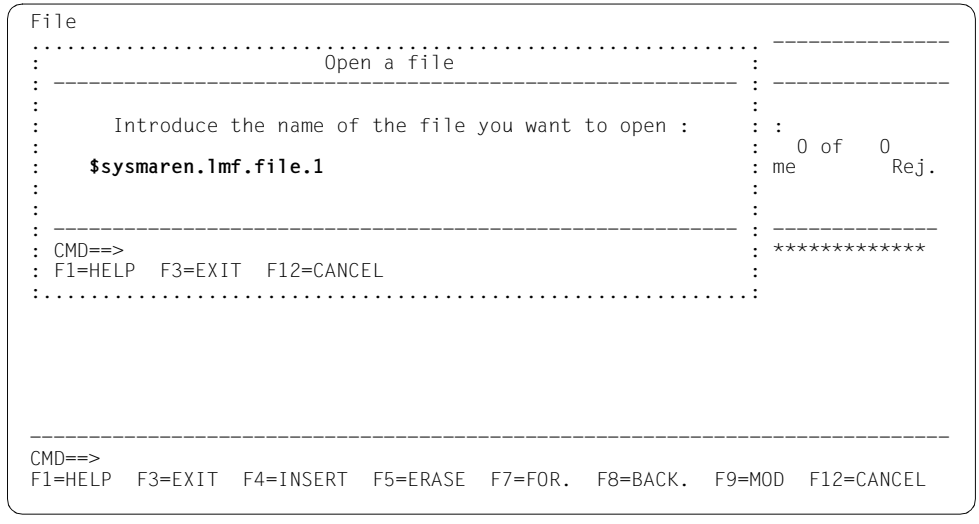
Creating and opening a new reservation file

File name Name of the new reservation file. If the file already exists, the user is requested to specify a new name.

2nd File: Open

Option *2* (*Open*) in the *File* menu opens an existing reservation file for processing. Any modifications made are not written to the file until it is saved (see options *Save* and *Save as*).

The name of the reservation file is queried in the following dialog box.



Opening an existing reservation file

File name Name of the reservation file. The file must already exist. If the file selected is not a reservation file (internal structure), the function is rejected.

3rd File: Save

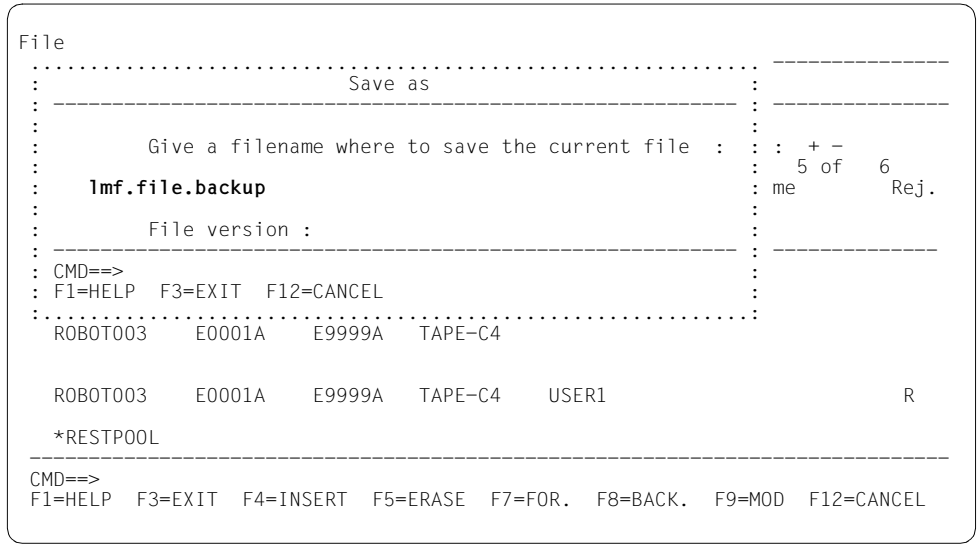
Option *3* (*Save*) in the *File* menu saves all entries in the reservation file that was opened with the menu option *Open* or *New*. The file is overwritten without a confirmation being requested.

The option *Save as* allows you to save the entries in another file.

4th File: Save as

Option *4* (*Save as*) in the *File* menu saves the current processing status of the reservation file in another file.

The name and version of the reservation file to which you want to save is queried in the following dialog box.



Saving the reservation file in another file

File name — Name of the file to which the current processing status is to be saved. If the file does not as yet exist, it will be created. If the file already exists, it is overwritten without confirmation being requested.

The version number of the reservation file can be “1”, “2”, or ”3”:
– 1 - without the FREE-POOL and Info fields
– 2 - with the FREE-POOL field, but without the Info field (MARENLM V2.0 and higher)
– 3 - with the FREE-POOL and Info fields (MARENLM V12.0B and higher)

5th File: Print

Option *5* (*Print*) in the *File* menu outputs the current processing status of the reservation file to a file in the form of a table (but without printer control characters). The contents of the file can subsequently be printed out using the PRINT-DOCUMENT command (via the SYS control statement or after MARENLM has be terminated).

The name of the file to which you want to save the entries is queried in the following dialog box.

```
File
 ..............................................................  ---------------
 :                            Print                            :
 : ----------------------------------------------------------- :  ---------------
 :                                                             :
 :          Please enter the name of the print file :          :  :  + -
 :                                                             :    5 of   6
 :                                                             :  me        Rej.
 :    out.lmf.file.1                                           :
 : ----------------------------------------------------------- :
 : CMD==>                                                      :  --------------
 : F1=Help  F3=Exit  F12=Cancel                                :
 :.............................................................:

   ROBOT003    E0001A    E9999A   TAPE-C4


   ROBOT003    E0001A    E9999A   TAPE-C4    USER1                         R

   *RESTPOOL
 -------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

Printing the reservation file

File name — Name of the file to which the edited current processing status is to be output. If the file does not as yet exist, it will be created. If the file already exists it is overwritten without a confirmation being requested

Layout of the data edited for printing

The output begins with the heading “The Maren Location Manager”. This is followed by the name of the edited reservation file and the number of records it contains. These entries are output in a table (198 characters wide). The columns appear in the same order as in the menu (three lines are required here). The following table lists the printout columns and the relevant menu columns:

Column in the printout	**Column in the menu**
Loc.	location
StartVSN	First-VSN
EndVSN	Last-VSN
Vol.type	Vol. Type
Userid	Userid
Jobname	Jobname
Re	Rej.
A/F	A/F
Arch.dir./filename	directory / filename
Free-Pool-Name	FREE-POOL name
Info	User information

Example (Info column not shown)

```
                                The Maren Location Manager
File name : out.lmf.file.1
Number of records : 6
------------------------------------------------------------------------------------------------------------
  Loc.  |StartVSN|EndVSN|Vol.type|  Userid  | Jobname | Re | A/F | Arch.dir./filename  |Free-Pool-Name
------------------------------------------------------------------------------------------------------------
ROBOTER1| C0001A |C0499A|TAPE-C4 | USER1    |         |    |  F  |                     |
ROBOTER2| D0001A |D9999A|TAPE-C4 | USER2    |         |    |     |                     |
ROBOTER1| C0500A |C0999A|TAPE-C4 | USER3    |         |    |     |                     |
ROBOTER3| E0001A |E9999A|TAPE-C4 |          |         |    |     |                     |
ROBOTER3| E0001A |E9999A|TAPE-C4 | USER1    |         |  R |     |                     |
ROBOTER3| E0001A |E9999A|TAPE-C4 | USER2    |         |  R |     |                     |
```

6th File: Exit

MARENLM is terminated with option *6* (*Exit*) in the *File* menu.
Note that the current processing status of the reservation file will not be saved. If any modifications have been made to the reservation file and you have not saved them with option *3* (*Save*) or option *4* (*Save as*), then MARENLM opens a window in which you must confirm termination.

You can also terminate MARENLM by pressing the F3 key, by entering the control statement EXIT or by pressing the F12 key. You will then be prompted for confirmation before MARENLM is terminated.

```
  File
.....................................................  ------------------------
:              Confirmation to quit                 :
: ------------------------------------------------- :  ------------------------
: Are you sure you want to quit MARENLM ? 1 1.YES   :
:                                         2.NO      :       More :  + -
:                                                   : om    3 to   5 of   6
:                                                   :       Jobname        Rej.
:                                                   :
:                                                   :
:                                                   :  ------------------------
:                                                   :
:...................................................:

  ROBOT003    E0001A    E9999A   TAPE-C4


  ROBOT003    E0001A    E9999A   TAPE-C4    USER1                          R

  *RESTPOOL
------------------------------------------------------------------------------
CMD==>
F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

Terminating MARENLM

6.3.3.4 Editing entries in the reservation file

MARENLAM does not perform a logical check. Not all fields of the reservation file need be assigned a value.

Modifying entry records

The fields of the entry record are write-protected. Entries that are to be modified first have to be selected by entering “X” or “/” in the selection column. The paging function can be used to page through the entries.

A selection is confirmed by pressing DUE. Following that, the modify function is called by pressing the F9 key or by entering the control statement MODIFY and pressing DUE.

The fields of the selected entries can now be modified. When all modifications have been made, the entries are protected again against overwriting by pressing DUE.

If the reservation file is just being created (option *New* in the *File* menu) the work area contains 3 “empty” entries. The entries can be modified immediately. They only have to be selected first, if the DUE key has already been pressed or if another function has already been called.

Inserting entry records

In order to insert a new entry record, an existing entry above or below which the new entry is to be included must first be selected in the selection column. Several positions can be selected simultaneously for new records to be inserted.

The following selections are available:

- “X” or “/” means that the new entry is inserted above the selected entry
- “A” means that the new entry is inserted below the selected entry

A selection is confirmed by pressing DUE. Following that, the insert function is called by pressing the F4 key or by entering the control statement INSERT and pressing DUE.

The new entries are initially empty. They can now be modified. When all modifications have been made, the entries are protected again against overwriting by pressing DUE.

Deleting entry records

Entries that are to be deleted must first be selected with “X” or “/”. The paging function can be used to page through the entries.

A selection is confirmed by pressing DUE. Following that, the delete function is called by pressing the F5 key or by entering the control statement ERASE and pressing DUE.

After that the selected entries are no longer available. They cannot be undeleted. Entries that were deleted by mistake can be reconstructed by recovering the status of the last backup of the reservation file (via the *File* menu and then option *Open*).

6.3.4 Editing the reservation file with an editor

A reservation file is edited with an editor just like any other file. You need only bear in mind that the format of the file (see the table below) must be retained. A reservation file which was created with MARENLM can be edited with an editor and vice versa.

Format of the entries in the reservation file

Field content	Position	Length
location	2	8
Start archive number of the number range	10	6
End archive number of the number range	16	6
Device type	22	8
User ID	30	8
Jobname	38	8
Reservation rejection	46	1
Utilization type (for a directory or file)	47	1
File name (directory or file)	48	54
Free pool name (name of a free tape pool)	102	54
Info	156	16

6.3.5 Examples

The examples below show reservation files using MARENLM masks. They can naturally also be edited with EDT.

Example 1: Defining a location for a specific user

When issuing a scratch request, USER1 may only access tapes in the location ROBOT001, and USER2 can only access tapes in the location ROBOT002. All other users access the default location.

In this case, the parameters have the following values:

```
 File
 ------------------------------------------------------------------------------
                          The Maren Location Manager
 ------------------------------------------------------------------------------
File : maren.lmf.1
                      List of location specification      More :
                                                     From   1 to   3 of   3
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
 ------------------------------------------------------------------------------
   ROBOT001                                  USER1


   ROBOT002                                  USER2


   *ANY


 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

Example 2: Reserving tapes in a specific location for a specific user

It is also possible to make very specific allocations. For instance, it is possible to reserve a specific device type from the location allotted to an archive system for a specific user who wishes to use the tape with HSMS/ARCHIVE, i.e. with a specific directory.

To achieve this, the parameters have to have the following values:

```
 File
 ------------------------------------------------------------------------------
                          The Maren Location Manager
 ------------------------------------------------------------------------------
File : maren.lmf.2
                      List of location specification      More :
                                                     From   1 to   3 of   3
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
 ------------------------------------------------------------------------------
   ROBOT       MT0001    MT0099   TAPE-C4    ADMIN        BACKUP
   A         :CAT:$ADMIN.ARCHIVE.DIR




   ********************************End of data*******************************


 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

The user ID ADMIN using the BACKUP job and the directory ARCHIVE.DIR, can use the tapes MT0001 through MT0099 at the location ROBOT.

In case of a HSMS request, BACKUP corresponds to the request name.

Example 3: Defining a location for a specific device type

If a scratch request is issued for device type TAPE-C4, the location ROBOT001 is to be accessed. All other tape requests access the default location.

In this case, the parameters have the following values:

```
 File
 ------------------------------------------------------------------------------
                          The Maren Location Manager
 ------------------------------------------------------------------------------
File : maren.lmf.3
                      List of location specification      More :
                                                      From   1 to   3 of   3
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
 ------------------------------------------------------------------------------
   ROBOT001                       TAPE-C4


   *ANY


   *********************************End of data*********************************


 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

If a user issues a scratch request for the file called “TEST”, the reservation has to be made with the location ROBOT002.

In this case, the parameters would have the following values:

```
File
------------------------------------------------------------------------------
                          The Maren Location Manager
------------------------------------------------------------------------------
File : maren.lmf.3
                     List of location specification      More :
                                                    From   1 to   3 of   3
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
------------------------------------------------------------------------------
   ROBOT002                        TAPE-C4
   F         TEST
                                                          IF TEST/F & T-C4
   ROBOT001                        TAPE-C4
                                                          IF T-C4
   *ANY
                                                          OTHER
------------------------------------------------------------------------------
CMD==>
F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

Note the order of the entries in this example: if entries 2 and 3 were to be switched around, the entry for ROBOT002 would not be read by MARENLM because the default location would be found first and the reservation made.

The field contains user information or a comment.

Example 4: Defining a number range for a user ID

A range of tapes is to be defined for USER1 in the default location.

In this case, the parameters have the following values:

```
File
------------------------------------------------------------------------------
                          The Maren Location Manager
------------------------------------------------------------------------------
File : maren.lmf.4
                      List of location specification      More :
                                                    From   1 to   3 of   3
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
------------------------------------------------------------------------------
   *ANY        MT0001    MT0099              USER1


   *ANY


   ********************************End of data*******************************


------------------------------------------------------------------------------
CMD==>
F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

Example 5: Using the reject field

All scratch requests for device type TAPE-C4 are to be rejected.

```
 File
 ------------------------------------------------------------------------------
                           The Maren Location Manager
 ------------------------------------------------------------------------------
File : maren.lmf.5
                      List of location specification      More :
                                                    From   1 to   2 of   2
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
 ------------------------------------------------------------------------------
   *ANY                            TAPE-C4                                  R


   *ANY


   *********************************End of data*********************************


 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

Example 6: Combinations

As shown in the following example, the various application options offered by MARENLM can be combined:

```
File
------------------------------------------------------------------------------
                          The Maren Location Manager
------------------------------------------------------------------------------
File : maren.lmf.6
               List of location specification    More :  + -
                                                   From   1 to   3 of   13
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
------------------------------------------------------------------------------
   ROBOT002    MT0001    MT0005   TAPE-C4    USER1        TEST                  --> 1)
   F         FILE1

   ROBOT                          TAPE-C4    USER1                        R     --> 2)

   *ANY                                      USER2                              --> 3)


------------------------------------------------------------------------------
CMD==>
F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

```
File
------------------------------------------------------------------------------
                          The Maren Location Manager
------------------------------------------------------------------------------
File : maren.lmf.6
                      List of location specification      More :  + -
                                                            From   4 to   6 of   13
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
------------------------------------------------------------------------------
   *ANY                           TAPE-U4                                      --> 4)

   ROBOT002    MT0006    MT0010   TAPE-U5    USER3                             --> 5)
   A         ARCHIVE1

   ROBOT003    MT2541    MT2542   TAPE-U4                 TEST2                --> 6)


------------------------------------------------------------------------------
CMD==>
F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

1st entry: The user USER1 with the job name TEST may use the TAPE-C4 tapes from the number range MB0001 through MB0005 for the file FILE1 at location ROBOT002.

2nd entry: Any other requests for TAPE-C4 tapes by the user USER1 are rejected.

3rd entry: All requests from the user USER2 are satisfied from the location the user has specified with ADD-MAREN-FILE-ENTRY LOCATION= ... or in ARCHIVE/HSMS, or from the DEFAULT-HOME-LOCATION.

4th entry: All requests for TAPE-U4 tapes are satisfied from the location the user has specified with ADD-MAREN-FILE-ENTRY LOCATION= ... or in ARCHIVE/HSMS, or from the DEFAULT-HOME-LOCATION.

5th entry: Requests for TAPE-U5 tapes for the directory ARCHIVE1 by the user USER3 are satisfied from the location ROBOT002 and the number range MB0006-MB0010.

6th entry: This entry is meaningless as requests for TAPE-U4 were already dealt with in the 4th entry.

Example 7: Allocating the free tape pool *TSOS

It may be necessary to modify the free tape pool to restore the old behavior, since the owner of the directory determines the presetting of the free pool if MAREN is used in combination with HSMS/ARCHIVE as of V6.0.

All directories of the SYSHSMS user ID will receive free tapes out of the free tape pool FREE-POOL=*TSOS (see line 1 in the list of the following screen). All directories of the TSOS user ID will be allocated to the free tape pool FREE-POOL=*TSOS by MAREN as default if this pool exists.

```
 File
 ------------------------------------------------------------------------------
                           The Maren Location Manager
 ------------------------------------------------------------------------------
File : maren.lmf.7
                     List of location specification      More :
                                                    From   1 to   2 of   2
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
 ------------------------------------------------------------------------------
   *ANY
   A         $SYSHSMS.
   *TSOS
   *ANY


   *******************************End of data*******************************


 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

All HSMS/ARCHIVE jobs shall receive their free tapes out ot the free tape pool FREE-POOL=*TSOS.

```
 File
 ------------------------------------------------------------------------------
                          The Maren Location Manager
 ------------------------------------------------------------------------------
File : maren.lmf.7
                      List of location specification      More :
                                                    From   1 to   2 of   2
 S Location  Start-VSN  Last-VSN  Vol.Type    Userid       Jobname        Rej.
   A/F       ARCHIVE-Directory / Filename
   FREE-POOL-Name                                         Info
 ------------------------------------------------------------------------------
   *ANY
   A
   *TSOS
   *ANY


   *********************************End of data*********************************


 ------------------------------------------------------------------------------
 CMD==>
 F1=HELP  F3=EXIT  F4=INSERT  F5=ERASE  F7=FOR.  F8=BACK.  F9=MOD  F12=CANCEL
```

7 MAREN and BS2000 software products

The BS2000 software products HSMS, ARCHIVE, FDDRL, and AVAS can work together with MAREN.

7.1 HSMS and ARCHIVE

Detailed descriptions of these software products are provided in the “HSMS” [13] and “ARCHIVE” [3] manuals.

The MAREN catalog is the central administration point for all tapes, including the backup tapes used by HSMS and ARCHIVE in a data center. The information on the backup tapes contained in the MAREN catalog must always accurately reflect the actual status. HSMS and ARCHIVE manage the information on the backups created and their tapes in archive directories, which are referred to as directories.

The information in the MAREN catalog must always be consistent with the information in all directories. I.e. an archive number should not be identified as being “free” in the MAREN catalog but still contained in a directory.

HSMS/ARCHIVE and MAREN consequently have internal interfaces for exchanging information. To guarantee the MAREN catalog and the directories remain consistent, **when HSMS/ARCHIVE and MAREN are used, the BS2000 systems support must ensure that MAREN is always loaded and operational.**

Administration of the archive numbers is facilitated by the cooperation of MAREN and HSMS/ARCHIVE. An archive number which is added to a directory needs no MAREN statement, as the MAREN catalog is automatically updated correspondingly.

The MAREN administrator can assign specific HSMS/ARCHIVE applications specific archive numbers or archive number ranges. For instance, this always enables the save operation to be executed on a specific set of tapes.

When automatic free tape allocation is used in MAREN, manual entry of an archive number is not required. This is achieved under HSMS with the `VOLUMES= *FROM-OPERATOR` operand, and under ARCHIVE with the `TAPES=OPERATOR` operand of the backup statements concerned. The MAREN catalog and directories are then updated automatically.

Administration of the tapes is largely identical in HSMS and ARCHIVE. This also applies for the interfaces to MAREN, and is evident in some terms. For instance, no distinction is made between HSMS and ARCHIVE in the MAREN free tape pools. In MAREN, only the term ARCHIVE free tape pool exists, although corresponding usage by HSMS is meant. From MAREN's viewpoint, no distinction is made between HSMS and ARCHIVE.

Furthermore, the mechanisms presented here are not restricted to the backup functions of HSMS and ARCHIVE, but also apply analogously for data migration under HSMS to storage level S2. However, for simplicity's sake, only backup is referred to below. Backup files (comparable with the normal data backup) are also written to tape in the case of data migration. No distinction exists from MAREN's point of view.

In MAREN, free tapes can be prereserved for HSMS/ARCHIVE applications by assigning them to a HSMS/ARCHIVE free tape pool. This prereservation of free HSMS/ARCHIVE tapes within the MAREN free tape pool is implemented for specific directory names or globally for HSMS/ARCHIVE applications, and is the responsibility of the MAREN administrator.

This allows the data center to supply the normal save runs (e.g. daily, weekly or monthly save runs) with the correct tapes and permanently defined directories. User save systems with their own directories can use the above mechanism or access any number of tapes from the global MAREN free tape pool for HSMS/ARCHIVE.

7.1.1 HSMS/ARCHIVE free tape pools in the MAREN catalog

In addition to general free tape pools in the MAREN catalog, special free tape pools for HSMS/ARCHIVE applications can be set up or removed by the All-Domain-Administrator (ADA) using the statement below:

```
//MODIFY-MAREN-PARAMETERS ...,
   FREE-POOLS=*PARAMETERS(FREE-POOL=<freepool>,ACTION=*ADD/*REMOVE)
```

The overall structure of HSMS/ARCHIVE free tape pools in the MAREN catalog may be as follows:

Free tape pool	Application
FREE-POOL=directoryname 1	prereserved for directory 1
...	...
FREE-POOL=directoryname n	prereserved for directory n
FREE-POOL=*TSOS	prereserved for other HSMS/ARCHIVE applications under TSOS or for applications whose directory is cataloged under the TSOS user ID.
FREE-POOL=*GLOBAL	prereserved for all other HSMS/ARCHIVE applications under any user Ids or for applications whose directory is cataloged under any user ID.

All HSMS/ARCHIVE free tape pools are optional. See page 163 for how to select a pool
If an HSMS/ARCHIVE free tape pool is set up, HSMS/ARCHIVE free tape requests will only be responded to by this pool. Therefore you must ensure that there are enough free tapes maintained in each of the pools.

Only the All-Domain-Administrator can add tapes to the HSMS/ARCHIVE free tape pools. In the case of a free tape, this can be done using one of the following MAREN statements:

- if the tapes are not yet in the MAREN catalog:
  `//ADD-FREE-VOLUMES ..., FREE-POOL=...`
- if the tapes are already entered in the MAREN catalog:
  `//MODIFY-VOLUME-ATTRIBUTES ...,SELECT=*FREE(NEW-FREE-POOL=...)`

Tapes of the local data center which are already reserved can be assigned to a HSMS/ARCHIVE free tape pool retroactively with the MAREN statement below:

```
//MODIFY-VOLUME-ATTRIBUTES ...,SELECT=*RES(NEW-FREE-POOL=...)
```

By the same token, the allocation to an HSMS/ARCHIVE free tape pool for these tapes can also be canceled (`NEW-FREE-POOL=*NO`).

The individual values for FREE-POOL effect the following allocation to individual free tape pools in the MAREN catalog:

FREE-POOL=	**Meaning**
*NO	The tapes are added to the general and not the HSMS/ARCHIVE related free tape pool.
*GLOBAL	The tapes will be added to the free tape pool for general HSMS/ARCHIVE applications under any user ID.
*TSOS	The tapes will be added to the free tape pool for HSMS/ARCHIVE applications under the user ID TSOS. FREE-POOL=*TSOS is the free tape pool for HSMS/ARCHIVE tapes which are cataloged under the TSOS user ID.
<filename 1..54 without-gen-vers>	The tapes are added to the free tape pool in the directory specified in this statement.

The specified tapes are added to the appropriate free tape pool; if this does not exist, it will be created.

Canceling HSMS/ARCHIVE free tape pools

Existing HSMS/ARCHIVE free tape pools can be canceled as follows:

- For free tape pools with free tapes
```
//MODIFY-VOLUME-ATTRIBUTES ...,
   SELECT=*FREE(FREE-POOL=<freepool>,NEW-FREE-POOL=*NO)
```
- For free tape pools with reserved tapes
  If the free tape pool is for a directory, the following statement is sufficient:
```
//MODIFY-VOLUME-ATTRIBUTES ...,
   SELECT=*RES(DIR-NAME=<filename>,NEW-FREE-POOL=*NO)
```
  If one of the *TSOS or *GLOBAL HSMS/ARCHIVE free tape pools is to be canceled, this statement must be entered for all directories containing tapes from this pool. If there are also tapes which are not in a directory, these must be modified individually or as part of a number range:
```
//MODIFY-VOLUME-ATTRIBUTES VOL=*INT(...),SELECT=*RES(NEW-FREE-POOL=*NO)
```
- Deletion of free tape pool when no more tapes are allocated to this free tape pool (free tape pool empty).
```
//MODIFY-MAREN-PARAMETERS ...,
   FREE-POOLS=*PARAMETERS(FREE-POOL=<freepool>,ACTION=*REMOVE)
```
- Deletion of free tapes from the MAREN catalog which are no longer required:
```
//REMOVE-FREE-VOLUMES=..., FREE-POOL=...
```

7.1.2 Implicit/explicit reservation from the HSMS/ARCHIVE free tape pools

MAREN permits the reading and writing of a tape only when the tape has been reserved for a user ID in the MAREN catalog. The tapes in the HSMS/ARCHIVE free tape pool are not reserved, but they are “prereserved”. This means a tape from a HSMS/ARCHIVE free tape pool must first be reserved for the requesting user ID, before actual processing can be carried out. This reservation can be implemented either implicitly by means of automatic free tape allocation with MARENUCP or explicitly using the statement below.

HSMS:
```
//MODIFY-ARCHIVE ARCHIVE-NAME=..., VOLUMES=*ADD(VOLUMES=...)
```

ARCHIVE:
```
*POOL DIRECTORY=...,ADD=(<vsn>,...)
```

Implicit reservation

In a data center with MAREN, it is advisable to leave the administration of the free HSMS/ARCHIVE tapes to MAREN and to keep only the written tapes in the directories. This mode of operation is automatically applied when there are no available archive numbers in the directory.

The existing save jobs need not be altered to reserve additional tapes, because if the pool is empty all the required archive numbers will be requested from the operator with the HSMS statement `//BACKUP-FILES .. VOLUMES=*FROM-POOL` or the ARCHIVE statement `*SAVE...,TAPES=POOL`. The `VOLUMES=*OPERATOR` (HSMS) or `TAPES=OPERATOR` (ARCHIVE) operand does not need to be specified.

If a free tape is requested for an HSMS/ARCHIVE application, MARENUCP determines the archive number of an appropriate free tape and reserves this tape in the MAREN catalog for the requesting user ID.

The HSMS/ARCHIVE free tape pool from which the tape is then assigned depends both on the type of request and the existence of the individual pools. This is determined by the following criteria, which are applied in the following order:

1. If a directory is being used and a free tape pool exists for this directory, the tape will be assigned from this pool.
2. If the request is output from TSOS or if the directory is cataloged under TSOS and a free tape pool for TSOS exists, the request is satisfied from this pool.
3. If a pool for general HSMS/ARCHIVE applications (`FREE-POOL=*GLOBAL`) exists or if the directory is not cataloged under TSOS, the request is satisfied from this pool.
4. If there is no suitable pool, the tape will be assigned from the general free tape pool in MAREN.

The free tape pool can also be determined via a reservation file, see “Example 7: Allocating the free tape pool *TSOS” on page 157. If a reservation file is used, the rules 1-4 mentioned before do not apply.

If a pool empties during a session, MARENUCP does not automatically use another pool but addresses the operating. The operator must then take the appropriate steps according to how the data center is organized. Until the appropriate steps are taken, all the HSMS/ARCHIVE tasks are suspended.

Location

In HSMS/ARCHIVE, archive numbers can be requested from a specific location using the LOCATION operand in the BACKUP-FILES statement (HSMS) or in the SAVE statement (ARCHIVE).

If the MAREN administrator assigns tapes from a different location to the user by means of a MAREN exit, the specification of the user is ignored.

If the MAREN administrator assigns the user tapes from a different location using the MAREN Location Manager, the system-specific MAREN parameter OVERRULE-LOC decides on the further procedure:

– OVERRULE-LOC=REJECT: the location specified by the user is used (differing locations lead to the reservation being rejected)

– OVERRULE-LOC=YES: the location specified in the MARENLM is used

Explicit reservation

The HSMS statement `//MODIFY-ARCHIVE ... VOLUMES=*ADD(...)` or the ARCHIVE statement `POOL DIRECTORY=...,ADD=(<vsn>,...)` can be used to explicitly reserve prereserved tapes from the HSMS/ARCHIVE free tape pool in the MAREN catalog. These tapes are then allocated to the specified user ID in the MAREN catalog and entered in the directory as freely available archive numbers. This explicit reservation is not generally logical or necessary, but is nonetheless supported for reasons of compatibility or for unique situation. When using this type of reservation the given sequence for implicit reservation is compulsory. For example, if a free tape pool exists for a particular directory, only tapes from this pool can be reserved for the specified directory.

Special considerations for explicit reservation:

- The tape is prereserved for HSMS/ARCHIVE in the MAREN catalog, but not in an appropriate subset (e.g. prereserved for another directory name). In this case the ARCHIVE statement POOL is rejected with the corresponding error message.
- The tape is entered in the MAREN catalog as a “reserved tape in the local data center”. The statement is only accepted if the tape has already been assigned to the user’s own ID, it is not contained in a directory, and it has previously not been reserved for the user ID in a HSMS/ARCHIVE save run via the automatic free tape allocation. The statement is also rejected if a special free tape pool exists for this directory.
- The tape is entered in the MAREN catalog as a “reserved tape from a remote data center”. This statement is only accepted if the tape has been assigned to its own user ID in the MAREN catalog and has not yet been included in a directory for which there is also no special free tape pool.
- The tape is not contained in the MAREN catalog. If it is permitted for tapes not contained in the MAREN catalog to be processed using the MAREN parameter `FOREIGN-TAPE-CHECK=NO`, the tapes will be included in the directory; if not, they are rejected.
- If the archive number of a free tape is specified in the context of an HSMS/ARCHIVE save run (e.g. in the case of HSMS `//BACKUP-FILES .. VOLUMES=<vsn>` or ARCHIVE `*SAVE ..., TAPES=<vsn>`), this tape is also reserved, provided it is assigned to an appropriate HSMS/ARCHIVE free tape pool.

7.1.3 Releasing save tapes

The HSMS/ARCHIVE tapes which have been written without being allocated to a directory are only released during a release session if the expiration date has elapsed.

The “release session” in MAREN (FREE-VOLUMES statement) only releases those HSMS/ARCHIVE tapes managed in directories which have previously been removed from the relevant directory using one of the following statements:

HSMS:

```
//MODIFY-ARCHIVE ..., SAVE-FILES=*DELETE(...)
//MODIFY-ARCHIVE ..., VOLUMES=*REMOVE (...)
```

ARCHIVE:

```
*PURGE DIRECTORY=...,...
*POOL DIRECTORY=...,REMOVE=(<vsn>,...)
```

In the case of these statements, a number of catalog entry fields in the MAREN catalog are modified:

Catalog entry field	Modification using HSMS or ARCHIVE statements
FREE-DATE	is set to the current date, provided all three of the following conditions are satisfied: 1. A reserved tape of the local data center is concerned (VOLUME-STATUS=RESERVED) 2. The statement is executed under the user ID contained in the catalog entry (USER-ID), under the user ID TSOS, or under the user ID SYSHSMS. 3. The tape was reserved by the automatic free tape allocation MARENUCP.
EXPIRATION-DATE	is likewise set to the current date, provided it has not already expired.
INIT	is set to YES for reserved tapes of the local data center (VOL-STATUS= RESERVED) if the volume expiration date has not yet been reached (for HSMS with FORCED-DELETE=*YES or in the ARCHIVE statement PURGE ...,FORCE=YES).
DIR-NAME	is deleted. Special feature: if the tape is assigned to a special directory free tape pool, the DIRNAME field in the catalog entry is filled with the directory name specified for FREE-POOL=<filename>, as before. However, it is no longer output for the MAREN statement SHOW-VOLUME-ATTRIBUTES.
ARCH-USAGE	A flag to the effect that the tape is no longer contained in a directory is set internally. Only if this indicator is set in the catalog entry will the tapes be included in the next release session started by the MAREN administrator.

If inconsistencies have occurred, e.g. because tapes in HSMS/ARCHIVE were released while MAREN was not started, any inconsistency must, if necessary, be rectified manually. In the example given, it may be necessary to reset the allocation to the directory with the MAREN statement `//MODIFY-VOLUME-ATTRIBUTES ...,NEW-DIRECTORY-NAME=*NONE`. Only then can the tapes be released in the next release run of MAREN.

CAUTION!
This command must be used with caution, and only if the tape is no longer present in the specified directory. **Otherwise there is a danger of data loss.**
First ascertain the name of the archive to which the directory file is assigned. Then use the HSMS statement `//SHOW-ARCHIVE <archive_name>, SELECT=*VOLUMES(VOLUMES=<vsn>,,..)` or the ARCHIVE statement `*INQUIRE DIR=<dirname>,POOL`

Merely viewing the expiration date or free date is not sufficient since in the case of migration archives the tapes are as a rule not protected by retention periods.

After release, the tapes are reallocated to exactly the same subset of the MAREN free tape pools as they were in before reservation took place.

Premature release of a backup version

Several steps are necessary to reassign a tape whose expiration date has not yet elapsed to a pool:

1. The backup version concerned is deleted using the HSMS statement `//MODIFY-ARCHIVE SAVE-FILES=*DELETE` or the ARCHIVE statement `*PURGE ..., FORCE=YES`.
2. The tape is deleted from the pool using the `//MODIFY-ARCHIVE VOLUMES=*REMOVE` statement (HSMS) or the ARCHIVE statement `*POOL REMOVE=<vsn>`.
3. The tape must be newly initialized using the INIT utility program.
4. The tape is added to the pool again using the HSMS statement `//MODIFY-ARCHIVE VOLUMES=*ADD` or the ARCHIVE statement `*POOL ADD=<vsn>`.

These four steps are considerably simplified by the use of a special HSMS/ARCHIVE free tape pool and the “implicit reservation” procedure:

1. same as above
2. not applicable
3. the MAREN administrator starts a procedure which executes the release session and the subsequent initialization run.
4. not applicable

7.1.4 Notes

Reservation period

When the expiration date is assigned in the MAREN catalog, the specification of the retention period (RETPD) in the HSMS and ARCHIVE statements is observed. This value is copied to the MAREN field “Volume Expiration Date” when a backup tape is created. The expiration date in the catalog entry field “Tape Expiration Date” contains either the specification of the retention period from the save run or, if it is higher, the standard retention period set by the MAREN administrator.
The retention period can be modified by the MAREN administrator using the MARENADM statement MODIFY-VOLUME-ATTRIBUTES. The nonprivileged user can only prematurely release tapes reserved using HSMS/ARCHIVE (e.g. under ARCHIVE with `*PURGE ..., FORCE=YES`).

In a PURGE run, the MAREN field “Volume Expiration Date” is set to the current date if the user or the administrator did not modify the retention period via MAREN.

The retention period of HSMS backups can be modified retroactively under HSMS:

```
//MODIFY-ARCHIVE <archive-name>,
   SAVE-FILES=*RETENTION-PERIOD(SAVE-FILE-ID= <sfid>,RETPD-EXTENSION=...)
```

This command is used to adjust the retention period of the save file and of the associated tape in the directory and in the MAREN catalog. The volume expiration date on the tape remains unchanged. Thus when the user extends the retention period in HSMS and consequently MAREN, the tape would no longer be protected if MAREN were not used. BS2000 systems support must therefore ensure that MAREN is always loaded.

If, on the other hand, the user reduces the retention period, the tape must in all cases be reinitialized as the volume expiration date on the tape would prevent it from being overwritten.

Placing MAREN in service for the first time and handling directories which already exist

When MAREN is placed in service for the first time, existing directories can continue to be used normally. However, you must note the following:

- The tapes in these directories are not yet identified in the MAREN catalog as belonging to a directory. This means that when the expiration date has been reached, they will be released without first being removed from a directory via the ARCHIVE statement POOL or PURGE.
- If such a directory is deleted, the resetting of the directory name via the MARENADM statement MODIFY-VOLUME-ATTRIBUTES (operand NEW-DIRECTORY-NAME= *NONE) is not necessary to release the tape.
- As the directory name is not entered in the catalog entry, the archive numbers in the directory cannot be requested via the MARENADM statement SHOW-VOLUME-ATTRIBUTES (operand DIRECTORY-NAME).
- The tapes stored in these directories are not reserved in MAREN exclusively for HSMS/ARCHIVE applications. They can be overwritten with other utility routines at any time.
- If, however, new tapes are added to such a directory, for example via the ARCHIVE POOL statement or the free tape allocation facility, the tapes are then flagged as belonging to a directory and will not be released from the directory until they have been removed from the directory.
- All the differences listed can be eradicated by integrating existing directories fully into the MAREN catalog with the help of the MARENADM statement UPDATE-MAREN-CATALOG.

Handling the tapes of a backup

In ARCHIVE, saved files are combined in a backup version which can be addressed via the svid in ARCHIVE statements. However, in HSMS and consequently in MAREN also, files are combined in a save file identified by its SAVE-FILE-ID (sfid) (see section “Processing backups” on page 171). In MAREN, a save file created with ARCHIVE therefore has to be accessed using its sfid.

Access protection for HSMS/ARCHIVE save tapes

If a tape is reserved in the context of a backup, the catalog entry field USER-ACCESS is supplied with values.

Under HSMS, with the BACKUP-FILES or EXPORT-FILES statement:

Value in the HSMS statement	Archive entry field USER-ACCESS
SAVE-FILE= *NEW(...,USER-ACCESS=*ALL-USERS)	FOREIGN-READ-ONLY
SAVE-FILE= *NEW(...,USER-ACCESS=*OWNER-ONLY)	OWNER-ONLY

Under ARCHIVE,with the SAVE or EXPORT statement

Value in the ARCHIVE statement	Archive entry field USER-ACCESS
SHARE=YES	FOREIGN-READ-ONLY
SHARE=NO	OWNER-ONLY

If a tape is reserved by being added to a directory's free tape pool, only the system-specific MAREN parameter DEFAULT-USER-ACCESS is used to serve USER-ACCESS. The values (ALL-USERS, OWNER-ONLY, FOREIGN-READ-ONLY) are taken over unchanged here.

If save runs are performed with an already reserved tape, the contents of USER-ACCESS are generally not changed.
The only exception to this rule is when USER-ACCESS is set to OWNER-ONLY and the save run is executed with the parameter USER-ACCESS=*ALL-USERS (HSMS) or SHARE=YES (ARCHIVE). In this case, the USER-ACCESS value is changed to FOREIGN-READ-ONLY.

In addition, MAREN offers a special form of access protection for save tapes: these tapes can only be accessed by HSMS or ARCHIVE.

7.1.5 Processing backups

BS2000 predominantly uses HSMS and ARCHIVE for logical data backup. HSMS builds on ARCHIVE and, compared to ARCHIVE, offers a more user-friendly user interface and functional enhancements.

Irrespective of whether backups are created with HSMS or ARCHIVE or data is archived with HSMS, or is migrated or exported from the processing level to a background level, a backup file is always created.

This section describes how MAREN manages backup files on tapes.

A backup file can occupy several tapes. It can also be written simultaneously to various tapes (HSMS operand `PARALLEL-RUNS` or ARCHIVE operand `DRIVES`). In order to do this, HSMS/ARCHIVE starts a separate subtask for each of the parallel runs. Each subtask is assigned its own SUBSAVE number. Within a parallel run, each subtask may utilize follow-up tapes, each of which receives its own SUBSEQ number.

Overview of the fields involved:

SAVE-FILE	name of the backup file
SUBSAVE	subtask number
SUBSEQ	serial number of a subtask's tape

Example 1: backup using the HSMS statement BACKUP-FILES

```
//BACKUP-FILES ..,SAVE-FILE=*CONTINUE(SAVE-FILE-ID=S.040301.123651),...,
   OPERATION-CONTROl=*PARAMETERS(...,PARALLEL-RUNS=3)
```

A backup with SAVE-FILE-ID S.040301.123651 and 3 consecutive backup tasks (ARCHIVE subtasks) is started.

Each subtask is assigned its own SUBSAVE number.

Subtask 1 is assigned SUBSAVE number 0
Subtask 2 is assigned SUBSAVE number 1
Subtask 3 is assigned SUBSAVE number 2

Subtask 1 first writes to the tape with the archive number sich01, then to sich04 and finally to sich06.
Subtask 2 first writes to the tape with the archive number sich02 and then to sich05.
Subtask 3 first writes to the tape with the archive number sich03.

All of the tapes (from sich01 to sich06) are assigned the same SAVE-FILE-ID because all together they contain one single backup file (SAVE-FILE).

The following table gives an overview of the SUBSAVE and SUBSEQ assignments:

VSN	SAVE-FILE-ID	SUB-SAVE	SUB-SEQ
sich01	S.040301.123651	0	1
sich02	S.040301.123651	1	1
sich03	S.040301.123651	2	1
sich04	S.040301.123651	0	2
sich05	S.040301.123651	1	2
sich06	S.040301.123651	0	3

All of the tapes belong to the same backup. The MAREN and MARENADM can process tapes from one backup with consecutive save runs using the following statements:

- EXPORT-VOLUME
  This example uses the backup file form example 1:
  ```
  //EXPORT-VOLUME...,VOLUME=*BY-DIRECTORY(SAVE-FILE-ID=S.040301.123651)
  ```
- MODIFY-VOLUME-ATTRIBUTES
  Example:
  ```
  //MODIFY-VOLUME-ATTRIBUTES...,
     SELECT=*RESERVED(DIRECTORY-NAME=FILE.X(SAVE-FILE-ID=*LATEST))
  ```
- RETURN-VOLUME (MARENADM only)
  Example:
  ```
  //RETURN-VOLUMES...,
     VOLUME=*BY-DIRECTORY(DIRECTORY-NAME=:CATD:$SYSHSMS.DIRECTORYSYSBACKUP)
  ```
- SHOW-VOLUME-ATTRIBUTES
  Example for the use of the last save file but three:
  ```
  //SHOW-VOLUME-ATTRIBUTES...,DIRECTORY-NAME=FILE.Y(SAVE-FILE-ID=-3))
  ```

MAREN can perform such processing provided the backup was created while MAREN was loaded. See the note on page 159.

If, by way of exception, MAREN was not loaded, the MAREN administrator can update the SAVE-FILE-ID, SUB-SAVE-NUMBER, and SUB-SEQUENCE-NUMBER fields for the tapes of a backup in the MAREN catalog retroactively using the MARENADM statement MODIFY-VOLUME-ATTRIBUTES.

The SAVE-FILE-ID of a backup file can be addressed via its absolute name (in this particular example S.040301.123651) using a directory file or relative to the most recent backup. Note that MAREN operates in a network of systems. Should a directory file called :CAT:$USER.DIRECTORY, for instance, be located on System A and another directory file of the same name be located on system B within the same network, then MAREN would mix up the backups. If, for instance, the directory file `:CAT:$USER.DIRECTORY` exists on

System A in one system and another directory file with the same name `:CAT:$USER.DIRECTORY` exists on System B in the same network as System A, MAREN merges the backups and the unambiguous assignment is lost.

Example 2: backup run performed by HSMS and a detailed description of the process

The example below illustrates how a backup archive is created under HSMS, and how data is saved on four drives in parallel. It also shows how the properties of the save tapes in MAREN change in the case of backup, updating of the backup, and a new backup.

1. Entry of the HSMS archive MYBACKUP with the directory name `:POPP:$TSOS.MYBACKUP.DIR` in HSMS.

```
/HSMS
//CREATE-ARCHIVE ARCHIVE-NAME=MYBACKUP,-
// ALLOWED-USAGE=*BACKUP(SAVE-FILE-STRUCTURE=*SEVERAL-SVID),-
// DIRECTORY-NAME=$TSOS.MYBACKUP.DIR,RETENTION-PERIOD=5,-
// S2-DEVICE-TYPE=TAPE-C4,LOCATION=HSMSLOC
```

2. Starting the first backup using the PARALLEL-RUNS=4 operand. The output tapes are assigned by MARENUCP.

```
//BACKUP-FILES FILE-NAMES=*FROM-FILE(LIST-FILE-NAME=HOL.PAK),-
// ARCHIVE-NAME=MYBACKUP,TO-STORAGE=*S2-STORAGE-LEVEL,-
// OPERATION-CONTROL=*PARAMETERS(REQUEST-NAME=SFID#001,-
// PARALLEL-RUNS=4,REPORT=*FULL,OUTPUT=REPORT.SFID#001)
%  HSM0030 REQUEST 'SFID#001' CREATED IN ENVIRONMENT 'SF' WITH DATE
'<date>' AND TIME '<time>'
%  HSM0004 HSMS STATEMENT COMPLETED WITH WARNINGS
//END
```

   A section of the backup log lists information pertaining to the first backup run and indicates which SUBSAVE number is allocated to which output tape. The subtask of SUBSAVE number 3 is the only subtask to require two tapes (QE0022 and QE0024).

```
***   BACKUP - FILES                HSMS <version>       FULL
REPORT  *** <date> <time>           PAGE    1
...
REPORT  *** <date> <time>           PAGE    2
...
%  ARC0002 STATEMENT ACCEPTED. ARCHIVE SEQUENCE NUMBER 'A.020716.135432',
...
%  ARC0033 ARCHIVE SUBTASK TSN 'OD9N' GENERATED
%  ARC0033 ARCHIVE SUBTASK TSN 'OD9P' GENERATED
%  ARC0033 ARCHIVE SUBTASK TSN 'OD9Q' GENERATED
%  ARC0033 ARCHIVE SUBTASK TSN 'OD9R' GENERATED
%  ARC0815 SUBTASK '0' HAS TRANSFERRED '65294' PAM PAGES FOR '1' FILES
AND..  %  ARC0815 SUBTASK '1' HAS TRANSFERRED '74162' PAM PAGES FOR '1'
FILES AND..
%  ARC0815 SUBTASK '2' HAS TRANSFERRED '58558' PAM PAGES FOR '1' FILES
AND..
%  ARC0815 SUBTASK '3' HAS TRANSFERRED '148912' PAM PAGES FOR '2' FILES
AND..
SAVE FILE IDENTIFIER - S.040716.135432     SAVE-VERSION-DATE=<date> ...
SUBSAVE
NUMBER       VSNS
                0        QE0020
1        QE0021
2        QE0023
                3        QE0022, QE0024

SAVE FILE IDENTIFIER - S.040716.135432     SAVE-VERSION-DATE=<date> ...
```

3. Output of information concerning the backup tapes to MAREN. Instead of the operand SAVE-FILE-ID=-0, it is also possible to specify SAVE-FILE-ID= *LATEST, since this is the only and last backup. Specifying SAVE-FILE-ID= S.040716.135432 would also have the same effect.

```
/MARENADM
//SHOW-VOL-ATTR DIRECTORY-NAME=:POPP:$TSOS.MYBACKUP.DIR(SAVE-FILE-ID=0)
%  MARM195 NO DIRECT ACCESS TO MAREN CATALOG POSSIBLE

-------------------------------------------------------------------------------
 VOLUME USER-ID  REQ-NAME DIRECTORY-NAME  (SHORTENED) SAVE-FILE-ID SUB-SV/SEQ
-------------------------------------------------------------------------------
 QE0020 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 001
 QE0021 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 001
 QE0023 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 02 001
 QE0022 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 001
 QE0024 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 002

%  MARM120 TOTAL OF 5 MAREN CATALOG ENTRIES PROCESSED
```

You obtain detailed information on output tape QE0024 with:
`//SHOW-VOL-ATTR VOLUME=QE0024,INFORMATION=*MAXIMUM`

MARENADM is terminated with: `//END`

4. HSMS updates the existing backup file (SAVE-FILE=*CONTINUE operand).

```
/HSMS
//BACKUP-FILES FILE-NAMES=*FROM-FILE(LIST-FILE-NAME=HOL.PAK2),-
// ARCHIVE-NAME=MYBACKUP,SAVE-FILE=*CONTINUE,-
// OPERATION-CONTROL=*PARAMETERS(REQUEST-NAME=SFID#002,-
// PARALLEL-RUNS=4,WRITE-CHECKPOINTS=*STD,-
// SHADOW-COPY= *ALLOWED,REPORT=*FULL,OUTPUT=REPORT.SFID002)
%  HSM0030 REQUEST 'SFID#002' CREATED IN ENVIRONMENT 'SF' WITH DATE
'<date>' AND TIME <'time>'
//END
```

The following section of the backup log lists information pertaining to the backup run and indicates which SUBSAVE number is allocated to which output tape. Tapes which were not fully written in the preceding run are now updated.

```
***   BACKUP - FILES                HSMS <version>     FULL
REPORT  *** <date>   <time>     PAGE    1
...
ARC0002 STATEMENT ACCEPTED. ARCHIVE SEQUENCE NUMBER 'A.040716.141454', ...
% ARC0033 ARCHIVE SUBTASK TSN 'OEGM' GENERATED
% ARC0033 ARCHIVE SUBTASK TSN 'OEGN' GENERATED
% ARC0033 ARCHIVE SUBTASK TSN 'OEGP' GENERATED
% ARC0033 ARCHIVE SUBTASK TSN 'OEGQ' GENERATED
% ARC0815 SUBTASK '0' HAS TRANSFERRED '172831' PAM PAGES FOR '4' FILES ...
% ARC0815 SUBTASK '1' HAS TRANSFERRED '549310' PAM PAGES FOR '2' FILES
AND..
% ARC0815 SUBTASK '2' HAS TRANSFERRED '122446' PAM PAGES FOR '1' FILES
AND..  % ARC0815 SUBTASK '3' HAS TRANSFERRED '309514' PAM PAGES FOR '2'
FILES AND..

SAVE FILE IDENTIFIER - S.040716.135432     SAVE-VERSION-DATE=<date>   ...
             SUBSAVE
NUMBER       VSNS
                0        QE0020  QE0028  QE0033
1        QE0021  QE0027  QE0032  QE0035  QE0038  QE0040
2        QE0023  QE0029
3        QE0024  QE0030  QE0034  QE0037

SAVE FILE IDENTIFIER - S.040716.135432     SAVE-VERSION-DATE=<date>  ...
```

5. In MAREN, we now have the following situation.
   Instead of the operand SAVE-FILE-ID=-0, the operand SAVE-FILE-ID= *LATEST may also be specified, since this is still the only and the last backup version. Specifying SAVE-FILE-ID= S.040716.135432 would also have the same effect.

```
/MARENADM

//SHOW-VOL-ATTR DIR-NAME=:POPP:$TSOS.MYBACKUP.DIR(SAVE-FILE-ID=-0)

 ------------------------------------------------------------------------------
 VOLUME USER-ID  REQ-NAME DIRECTORY-NAME (SHORTENED)  SAVE-FILE-ID SUB-SV/SEQ
 ------------------------------------------------------------------------------
 QE0020 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 001
 QE0028 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 002
 QE0033 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 003
 QE0021 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 001
 QE0027 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 002
 QE0032 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 003
 QE0035 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 004
 QE0038 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 005
 QE0040 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 006
 QE0023 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 02 001
 QE0029 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 02 002
 QE0022 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 001
 QE0024 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 002
 QE0030 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 003
 QE0034 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 004
 QE0037 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 005
%  MARM120 TOTAL OF 16 MAREN CATALOG ENTRIES PROCESSED
```

   The tape QE0022 was no longer requested because it is already full.

   The tape QE0024 is given a new REQUEST-NAME and a new time stamp (including CR-DATE, LAST-ACC-TIME), see `//SHOW-VOL-ATTR VOLUME=QE0024,INFORMATION=*NORMAL` when the backup is continued (see above).

   MARENADM is terminated with: `//END`

6. In HSMS another backup is now stored in a new save file (`SAVE-FILE=*NEW` operand).

```
/HSMS
//BACKUP-FILENAMES FILE-NAMES=*FROM-FILE(LIST-FILE-NAME=HOL.PAK3),-
// ARCHIVE-NAME=MYBACKUP,SAVE-FILE=*NEW,-
// OPERATION-CONTROL=*PARAMETERS(REQUEST-NAME=SFID#003,PARALLEL-RUNS=2,-
// REPORT=*FULL,OUTPUT=REPORT.SFID003)
%  HSM0030 REQUEST 'SFID#003' CREATED IN ENVIRONMENT 'SF' WITH DATE
'<date>' AND TIME '<time>'
%  HSM0002 HSMS STATEMENT ACCEPTED
//END
```

A section of the backup log lists the information pertaining to the backup run and shows which SUBSAVE numbers are allocated to the individual output tapes.

```
***   BACKUP - FILES                HSMS <version>        FULL
REPORT  *** <date>  <time>     PAGE    1
...
%  ARC0002 STATEMENT ACCEPTED. ARCHIVE SEQUENCE NUMBER 'A.020716.142715',
VERSION '06.0A05'
% ARC0033 ARCHIVE SUBTASK TSN 'OEG5' GENERATED
% ARC0033 ARCHIVE SUBTASK TSN 'OEG6' GENERATED
% ARC0815 SUBTASK '0' HAS TRANSFERRED '514652' PAM PAGES FOR '3' FILES
AND..
% ARC0815 SUBTASK '1' HAS TRANSFERRED '293046' PAM PAGES FOR '2' FILES
AND..

SAVE FILE IDENTIFIER - S.040716.142715     SAVE-VERSION-DATE=<date>  ...
SUBSAVE
NUMBER       VSNS
               0        QE0044  QE0056  QE0059  QE0061  QE0062
1        QE0048  QE0057  QE0060

SAVE FILE IDENTIFIER - S.040716.142715     SAVE-VERSION-DATE=<date>  ...
***   CATALOG - POPP      USER - SYSROOT    ***
```

7. In MAREN, we now have the following situation.
   Instead of the operand SAVE-FILE-ID=-0, the operand SAVE-FILE-ID= *LATEST may also be specified, since this is still the only and the last backup version. Specifying SAVE-FILE-ID= S.040716.142715 would also have the same effect.

```
/MARENADM
//SHOW-VOL-ATTR DIR-NAME=:POPP:$TSOS.MYBACKUP.DIR(SAVE-FILE-ID=-0)
%  MARM195 NO DIRECT ACCESS TO MAREN CATALOG POSSIBLE

-------------------------------------------------------------------------------
VOLUME USER-ID  REQ-NAME DIRECTORY-NAME (SHORTENED)  SAVE-FILE-ID SUB-SV/SEQ
-------------------------------------------------------------------------------
QE0044 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 00 001
QE0056 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 00 002
QE0059 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 00 003
QE0061 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 00 004
QE0062 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 00 005
QE0048 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 01 001
QE0057 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 01 002
QE0060 TSOS     SFID#003 :POPP:$TSOS.MYBACKUP.DIR     S.040716.142715 01 003

%  MARM120 TOTAL OF 8 MAREN CATALOG ENTRIES PROCESSED
```

   If the operand value SAVE-FILE-ID=-1 or SAVE-FILE-ID=S.040716.135432 is specified, the information concerning the last backup but one is output (same as the output on page 176). In each new backup using SAVE-FILE=*NEW, the SAVE-FILE-ID S.040716.135432 moves one position further back.

```
//SHOW-VOL-ATTR DIR-NAME=:POPP:$TSOS.MYBACKUP.DIR(SAVE-FILE-ID=-1)

 ------------------------------------------------------------------------------
 VOLUME USER-ID  REQ-NAME DIRECTORY-NAME (SHORTENED)  SAVE-FILE-ID SUB-SV/SEQ
 ------------------------------------------------------------------------------
 QE0020 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 001
 QE0028 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 002
 QE0033 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 00 003
 QE0021 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 001
 QE0027 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 002
 QE0032 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 003
 QE0035 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 004
 QE0038 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 005
 QE0040 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 01 006
 QE0023 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 02 001
 QE0029 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 02 002
 QE0022 TSOS     SFID#001 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 001
 QE0024 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 002
 QE0030 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 003
 QE0034 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 004
 QE0037 TSOS     SFID#002 :POPP:$TSOS.MYBACKUP.DIR     S.040716.135432 03 005

%  MARM120 TOTAL OF 16 MAREN CATALOG ENTRIES PROCESSED
```

MARENADM is terminated with: `//END`

7.2 FDDRL

MAREN records the tapes used by the FDDRL DUMP function (see the manual “FDDRL” [10]) in the MAREN catalog. MAREN also supplies FDDRL with new tapes (automatic allocation of free tapes). The tapes can be retrieved from the MAREN catalog again by the user by means of a file name allocated to FDDRL.

When tapes are restored using the FDDRL statements RELOAD-DISK and RELOAD-PUBSET, the volume type is determined automatically. The user specifies the file name of the backup in the volume catalog using the TAPE=*BY-VOLUME-CATALOG operand. MAREN accesses the volume catalog and ascertains the backup tapes required.

Management in the MAREN catalog

MAREN manages all FDDRL tapes in the MAREN catalog. Only tapes contained in the MAREN catalog can be used in FDDRL backups.
If you want to use taps that are not in the MAREN catalog, the MAREN parameter FOREIGN-TAPE-CHECK must be set to *NO (see the MARENADM statement MODIFY-MAREN-PARAMETERS). A tape list may only contain foreign tapes or tapes from the MAREN catalog. If the list contains tapes from both, the first foreign tape will be rejected.

If tapes that are password-protected in the MAREN catalog are used, their passwords have to be entered in the task’s password list before the volume is requested (at the latest before the START-JOBS statement is issued) (ADD-PASSWORD).

The following catalog entry fields are updated for the tapes used in the backup:
- FILE-NAME (backup file name, see “MAREN tape set” on page 180)
- VOLUME-SEQUENCE (number of the tape in the tape set)
- FIRST-VOLUME (archive number of the first tape in the tape set)
- CREATION-DATE and CREATION-TIME
- EXPIRATION-DATE (calculated on the basis of the specified RETENTION-PERIOD)
- CLOSE-INDICATOR (for valid save tapes CLOSED)
- LAST-CLOSE-DATE and LAST-CLOSE-TIME
- CREATION-CATALOG-ID (catalog ID of the home pubset)
- CREATION-USER-ID (user ID of the backup task)
- CREATION-JOB-NAME (job name of the backup task)
- OPEN-MODE
- RESERVATION-DATE
- USER-ACCESS
- PASSWORD (*NONE, i.e. no password)

MAREN tape set

If several tapes are needed for a recovery unit, they are grouped to form a tape set under one file name (for a definition, see section “File version in the MAREN catalog” on page 78). The tapes of a MAREN tape set have the following features:

– They all have the same file name (FILE-NAME).
– For all tapes, the FIRST-VOLUME catalog entry field contains the archive number of the first tape in the tape set.
– The order of the tapes within the tape set is defined by ascending VOLUME-SEQUENCE numbers (from 0001 to 0255) and ascending creation dates (CREATION-DATE and CREATION-TIME).

When the backup is completed, the tapes of the tape set are all marked as valid backup tapes (CLOSE-INDICATOR=CLOSED). The first tape of a tape set is only marked as valid after the backup has been completed successfully. It thus shows that all tapes of a tape set have been successfully created.

Allocation of free tapes

In a backup using the FDDRL statement DUMP-PUBSET, MARENUCP reserves a free tape in the MAREN catalog and allocates it. This also applies in the event of a backup with the FDDRL statement DUMP-DISK with the operand TAPE=*ANY. In the catalog entries for these tapes, the following file name is initially entered for FILE-NAME:

- For the single disk recovery unit:
  - `FDDRL.D.<vsn_1..6>` with DUMP-DISK
  - `FDDRL.P.<catid_1..4>.<vsn_6..6>` with DUMP-PUBSET
- For the disk set recovery unit:
  - `FDDRL.D.<vsn_1..6>-1` with DUMP-DISK
  - `FDDRL.P.<catid_1..4>.<date>.<time>-<disk-set-no>` with DUMP-PUBSET

Meaning:

`FDDRL.P`	Prefix for backing up a pubset disk (in the case of DUMP-PUBSET)
`FDDRL.D`	Prefix for backing up single disks
`<catid_1..4>`	Pubset ID, 1 to 4 positions (catalog ID)
`<vsn_6..6>`	VSN of a pubset disk, 6 positions
`<vsn_1..6>`	VSN of a single disk, 1 to 6 positions
`<date>`	Date of the backup (format yyyy-mm-dd)
`<time>`	Time of the backup (format hhmm00)
`<disk-set-no>`	Number of the disk set (depends on NUMBER-OF-DISK-SETS)

Location

In FDDRL, archive numbers can be requested from a specific location using the LOCATION operand in the DUMP-PUBSET statement.

If the MAREN administrator assigns tapes from a different location to the user by means of a MAREN exit, the specification of the user is ignored.

If the MAREN administrator assigns the user tapes from a different location using the MAREN Location Manager, the system-specific MAREN parameter OVERRULE-LOC decides on the further procedure:

– OVERRULE-LOC=REJECT: the location specified by the user is used (differing locations lead to the reservation being rejected)

– OVERRULE-LOC=YES: the location specified in the MARENLM is used

7.3 AVAS

MAREN can be linked to the AVAS software products (see the “AVAS” manual [4]) by means of the MARENAV module. This module is connected to AVAS via the system exits used for SUBMIT-NET processing and calls MAREN as a subprogram. For each network to be released, AVAS sends the procedure or ENTER files of all jobs to MARENAV for analysis. On the basis of the DMS commands they contain, MARENAV determines the archive numbers of the tapes required by the network.

It then carries out the following actions:

- Execution of tape checks.

  MARENAV checks whether all the tapes required by the network are available, i.e. whether their archive number is in the MAREN catalog and the tapes are reserved.

- Entering archive numbers in the procedure or ENTER files

  The dummy input and output tapes entered in the DMS commands are replaced with actual archive numbers.

- Creation of tape lists.

  MARENAV generates three files for each network:

  a) Transport list, which is used to compile the set of tapes accessed in a network and, if necessary, transport it to the system.

  b) Tape mounting list for the operator, which indicates which tapes are required in which order when the individual jobs of a network are run.

  c) Storage procedure for the archive This procedure file updates the locations in the MAREN catalog entry for all volumes required by a network.

MARENAV is not an installation component of MAREN but is supplied with the software product AVAS.

8 MAREN and archive systems

MAREN supports the following archive systems:

- the real archive systems from Quantum Corp.
- the virtual archive system ETERNUS CS from Fujitsu Ltd.
  Unless a finer distinction is necessary, the term ETERNUS CS is used in this manual as a synonym for all previous names of ETERNUS CS: ETERNUS CS8000 (V6.0 SP1 and higher), ETERNUS CS HE (V5.0 and V5.1).

8.1 Archive systems

Archive systems can physically access the tapes in their tape inventory (archive) using mechanical installations. They can react to mount requests without the manual intervention of a human operator. For the process of mounting tapes to be automated, the mount requests have to be evaluated by a software program and converted into control commands which the archive system can interpret.

A BS2000 system can be linked to an archive system in two different ways:

1. The control commands are sent to the archive system through the data interface of the BS2000 system.
2. After the console messages have been evaluated, the control commands are output to the archive system through an interface.

These two methods are supported by two subsystems which complete MAREN tape management for physical tape processing.
MAREN identifies an archive system through its location name and operating mode. I.e. the location tells MAREN whether a tape belongs to the inventory of a specific archive system and how communication with the archive system must be realized.

In the MAREN catalog, the tapes are listed by their archive number and in the archive system by the bar code labels attached to them. Since the archive number (VNS, volume serial number) must be identical with the VSL (volume software label) in BS2000 the tape has to be started with a VSL in the archive system which is identical with the archive number of the tape requested.

Support via ROBAR

The ROBAR-DCAM non-privileged BS2000 application was developed to support archive system control via a specific link.

ROBAR is installed as a client/server system. The client is installed as a BS2000 DCAM application to query the console messages. The server is installed on a separate system and converts the requests sent by the client into control commands for the archive system.

In the standard shipment, ROBAR supports control commands for the real archive systems from Quantum Corp. and for the virtual archive system ETERNUS CS from Fujitsu Ltd.

ROBAR processes the console messages sent by the system to the console directly. MAREN is not a prerequisite.

If MAREN is available, ROBAR also supports MAREN messages which the archive system allocated to tape processing.

8.2 Real archive systems with ROBAR

Entering tapes

The tapes in the archive system are entered in the database. In the MAREN catalog, the database has to be mapped with the archive system's location using the appropriate MAREN statements for tape entry.

Removing tapes

Tapes that are exported by the archive system have to be reported to MAREN. Depending on the VOLUME-STATUS and the type of export, the catalog entry is either deleted (EXPORT-VOLUME for tapes from a remote data center) or it is relocated (TEMP-LOCATION=CENTRAL).

Importing tapes

Tapes can be imported into the archive system via the import/export unit. When the archive system finds new tapes in the input/output unit, it adds them to the its inventory and informs the system via ROBAR. ROBAR then updates the location of the new tapes in the MAREN catalog.

MAREN does not update the location of tapes that are not included in the catalog.

Relocating tapes

Tapes can be exported from the archive system via the import/export unit. If MAREN is used, they have to be exported using a MAREN statement which causes the location to be changed (export or location modification in the catalog entry).

If MAREN is not used, a tape export can be requested at the ROBAR console.

While the tape is exported from the archive system, it is flagged as not available or it is deleted from the archive record (archive system database).

8.2.1 Exporting tapes

MAREN causes tapes to be exported in the following events:

- **Exporting a tape**

  The MAREN user (or the MAREN administrator on behalf of the user) borrows a tape to another user and exports it as follows:
  ```
  //EXPORT-VOLUME VOLUME=...,EXPORT-ADDRESS=...
  ```

  The tape thus leaves the area of the local data center.

  MAREN checks whether the user is authorized to export the tape. Following this, MAREN instructs the archive system to make the tape available in the input/output unit. It can be exported from there.

  Reserved tapes from the local data center are marked as exported in the MAREN catalog, i.e. the current date is entered as the export date in the catalog entry field EXPORT-DATE.
  Foreign tapes are removed from the MAREN catalog.

  Free tapes (VOLUME-STATUS=FREE) cannot be exported.

- **Relocating a tape**

  The MAREN administrator can move the tapes to another location in a MARENADM clear-up run.

  To do this, the MAREN administrator or the user enters the target location:
  ```
  //MODIFY-VOLUME-ATTRIBUTES VOLUME=...,
           LOCATION=PARAMETERS(HOME-LOCATION=<target-location>)
  ```

  The administrator then starts the relocation with:
  ```
  //RETURN-VOLUMES VOLUME=...,
           FROM-LOCATION=<robot-location>,TO-LOCATION=<target-location>,
           MESSAGE-DESTINATION=...
  ```

  MAREN displays a corresponding transport message at the output device specified with the MESSAGE-DESTINATION operand.

  In order to accelerate execution, the range of volumes affected should be limited by means of the operand VOLUME=*INTERVAL(...).

  The usual request for relocation (`MAR4164`) is displayed for each tape to which the conditions apply, and the archive system is instructed to move the tape into the import/export unit.

8.2.2 Returning tapes

Tapes which have been exported or sent to another location can be returned to the archive system as follows:

The tapes are placed in an input/output unit. Then the archive system is instructed via the ROBAR statement IMPORT-ROBAR-VOLUME to fetch the tapes from the import/export unit.
The corresponding catalog entry in the MAREN catalog is updated as soon as the tape has been placed in the rack:

EXPORT-DATE is cleared

INITIALIZATION is set to YES

TEMPORARY-LOCATION
is supplied with the archive system's location name

8.2.3 Relocating tapes

Reserved, foreign and free tapes can be moved to an archive system in a MARENADM clear-up session. To do this, the following MARENADM statements must be entered:

```
//MODIFY-VOLUME-ATTRIBUTES VOLUME=...,
         LOCATION=PARAMETERS(HOME-LOCATION=<robar-location>)

//RETURN-VOLUMES VOLUME=....,
         FROM-LOCATION=<current-location>,TO-LOCATION=<robar-location>,
         MESSAGE-DESTINATION=...
```

MARENADM displays a transport message at the output device specified with the MESSAGE-DESTINATION operand. When the tape is inserted in the input area of the archive system's import/export unit, ROBAR causes MAREN to update the MAREN catalog entry with the temporary storage location.

8.2.4 Implicit/explicit tape import

ROBAR informs MAREN when a tape is placed in the import/export unit of an archive system. The entry is only modified if it already exists. The tape is not implicitly added to the MAREN catalog.

Explicit import of tapes

Adding free tapes

If the tape to be imported is to be added to the MAREN catalog as a free tape, it must be cataloged beforehand using the MARENADM statement below:

```
//ADD-FREE-VOLUMES VOLUME=...,FREE-LOCATION=<location-name>
```

<location-name> is the storage location name of the archive system. In contrast to manual operation, MARENADM sets the temporary storage location to “CENTRAL”. This way, the tape cannot be reserved before it is actually present in the archive system. The MAREN catalog entry for the current location is automatically updated when the tape is inserted in the import/export unit.

Adding reserved tapes

If the tape to be imported is to be added to the MAREN catalog as a reserved tape, it must be cataloged beforehand using the MARENADM statement below:

```
//ADD-RESERVED-VOLUME VOLUME=..., USER-ID=<userid>,
   LOCATION=PARAMETERS(HOME-LOCATION=<location-name>)
```

<userid> is the user ID for the tape. <location-name> is the name of the default storage location of the tape in the archive system. When the tape is then inserted in the archive system’s import/export unit, the MAREN catalog entry for the temporary storage location will be updated. The tape can now be requested.

Adding foreign tapes

During archiving, tapes not currently in the MAREN catalog will be archived as foreign tapes.

If these tapes are to display attributes in the MAREN catalog which differ from those used for the implicit new addition, they must also be added in advance using the MARENADM statement IMPORT-FOREIGN-VOLUME and then modified with MODIFY-VOLUME-ATTRIBUTES.

Example

If the tape TAPE01 is to be allocated to the user ID ROBUSER, and not to SYSMAREN, the following MARENADM statement must be issued before the tape is placed in the import/export unit of the archive system with the location name “ROBAR”:

```
//IMPORT-FOREIGN-VOLUME VOLUME=TAPE01,USER-ID=ROBUSER,LOCATION=ROBAR
```

When the tape is then inserted in the archive system’s import/export unit, the MAREN catalog entry for the temporary storage location will be updated. The tape can now be requested.

If there is already a tape with the same archive number as the private tape, this tape can be temporarily locked. But archive system tape must first be exported.

8.2.5 Deleting catalog entries

The following applies to MARENADM statements when deleting catalog entries for the tapes of the archive system:

- REMOVE-USER-VOLUMES

  The tape must first be exported from the archive system (see section “Exporting tapes” on page 186). Only then can the catalog entry be deleted from the MAREN catalog.

- REMOVE-FREE-VOLUMES

  The archive system’s free tapes can be removed from the MAREN catalog using this statement.

- DELETE-VOLUME-ENTRY

  This statement deletes MAREN catalog entries for tapes without any checks. The statement is intended for repair use only. If the corresponding tapes are still located in the archive system, there will be discrepancies between the MAREN catalog and the archive system.

8.3 Virtual archive system ETERNUS CS with ROBAR

Entering tapes

The same procedure is used as for real archive systems, but the virtual tapes are defined at the operator interface for the virtual archive system. However, no physical tapes are included in the virtual archive system.

Removing tapes

This operation must be supported in a virtual archive. Removing a virtual tape, however, does not mean that any physical tapes are truly relocated. A virtual tape is deleted from the virtual archive system via the operator interface.

Importing and exporting tapes

Since no physical operations are performed for virtual tapes, these operations are not supported for virtual archive systems. MAREN does not allow virtual volumes to be relocated from a virtual location.

MAREN supports the ETERNUS CS virtual archive system, which is controlled through the ROBAR software product, as is the real archive system. In contrast to a real archive system, the tapes used by ETERNUS CS are defined as virtual. They are managed by MAREN in the same way as real TAPE-C4 tapes.

Virtual tapes contained in the ETERNUS CS cache can be accessed directly for read and write operations, i.e. a device does not need to be requested.

ETERNUS CS HE exports virtual tapes to real tapes. ETERNUS CS determines the point in time when this is done. Only ETERNUS CS knows which real tape a virtual tape is allocated to. When a tape is accessed, ETERNUS CS has to retrieve it from the real tape and relocate it in the cache, if it no longer exists there.

8.3.1 Configuration

The virtual ETERNUS CS tapes must be allocated to a location of their own with the ROBAR-2 operating mode for them to be distinguished from real tapes. The following steps must be performed:

1. The location for virtual tapes is defined in MAREN:

   The new location is added to the MAREN catalog with the MARENADM statement MODIFY-MAREN-PARAMETER. The location name can be freely selected, e.g.:

   ```
   //MODIFY-MAREN-PARAMETERS LOCATION-ENTRIES=*PARAMETERS
        (LOCATION-NAME=CENTSTOR,ACTION=*ADD(OPERATING-MODE=*ROBAR-2))
   ```

   If several virtual archive systems are used, a separate location must be defined for each of them.

2. The virtual archive system is defined in the device administration of the BS2000 systems of the systems concerned:

   The virtual ETERNUS CS devices are included in the I/O configuration with device type code C4. The virtual devices are allocated to a location defined in MAREN for the virtual ETERNUS CS tapes with the command ADD-DEVICE-DEPOT input via the console, for instance to the location CENTSTOR:

   ```
   /ADD-DEVICE-DEPOT UNIT=(V1,V2,V3),LOCATION=CENTSTOR
   ```

   The allocation is only valid in the current system session.

   Unconditional unloading of virtual tapes should be set for virtual tape operation with ETERNUS CS (as it should also be for real archive systems):

   ```
   /MODIFY-MOUNT-PARAMETER
        UNLOAD-REL-TAPE=*REGARDLESS-OF-USER-REQUEST(TAPE-FAM=*MBK)
   ```

3. The virtual archive system is defined in ROBAR:

   1. The location must be defined in the ROBAR configuration file using the same name:
      `LOCATION=CENTSTOR`
   2. When the ROBAR rule file is installed, the version for ETERNUS CS must be used. The rrf_dir parameter must not be used.

   For further details, refer to the “ROBAR” manual [19].

4. The virtual tapes are defined:

   The virtual tapes must be defined both in ETERNUS CS and in the MAREN catalog.

   The desired number of virtual tapes is defined in ETERNUS CS HE using the OCI (Operator Console Interface). Refer also to the “ETERNUS CS” manual [9]).

   ETERNUS CS’s virtual tapes are added to the MAREN catalog as free tapes of the type TAPE-C4 using MARENADM:

   ```
   //ADD-FREE-VOLUMES ...,FREE-LOCATION=CENTSTOR,DEVICE-TYPE=TAPE-C4
   ```

   If a ETERNUS CS HE archive system and its already existing virtual tapes is to be included in a MAREN configuration, the virtual tapes must be added to the MAREN catalog as reserved tapes (you must find the archive numbers in ETERNUS CS):

   ```
   //ADD-RESERVED-VOLUMES vsn1(USER-ID=...,DEVICE-TYPE=TAPE-C4,
         LOCATION=*PAR(HOME-LOCATION=CENTSTOR,FREE-LOCATION=CENTSTOR,
         TEMP-LOCATION=CENTSTOR))
   ```

8.3.2 Working with virtual tapes

A virtual tape cannot be relocated, i.e. the attributes HOME-LOCATION, FREE-LOCATION and TEMP-LOCATION must all be the same. Any actions causing a relocation are rejected by MAREN and MARENADM.

A virtual tape cannot be exported: The EXPORT-VOLUME statement is rejected with the message `MARM015` if the current location (TEMP-LOCATION) and the ROBAR-2 operating mode are defined.

The RETURN-VOLUME statement is not executed for a virtual tape because the current location (TEMP-LOCATION) and the home location (HOME-LOCATION) must always be the same.

Changing the location

The location of a virtual tape (and of other tapes, too) can be changed using the MODIFY-VOLUME-ATTRIBUTES statement. To do this, the HOME-LOCATION, FREE-LOCATION and TEMPORARY-LOCATION operands must be modified to indicate the same location. This new location must offer the operating mode ROBAR-2 (ETERNUS CS). Parallel to the location being changed in MAREN, corresponding modifications must be made in ETERNUS CS.

Support of the fast mount attribute

After a virtual tape has been defined in ETERNUS CS or after it has been initialized, it is implicitly given the “fast mount” attribute. “Fast mount” means that the tape is immediately available for processing. The times required for mounting, etc., are not required for “fast mount” tapes.
If user data is written to the tape, ETERNUS CS will make sure that it is saved on a real tape. Once this has been done, the reserved cache area can be released and another virtual tape can be used. The tape is no longer a “fast mount” tape once its data has been overwritten in the cache.

The “fast mount” attribute only describes a virtual tape’s status in ETERNUS CS. It cannot be assigned as a tape attribute in the MAREN catalog.

When MAREN or ROBAR determines that the next access to a virtual tape can only be a write operation from the beginning of the tape, they cause ETERNUS CS to assign the “fast mount” attribute to the tape. This happens in the following situations:

- The virtual tape was initialized either using the MARENADM statement INIT-VOLUMES or the INIT utility routine. Since ROBAR recognizes whether a virtual tape is initialized or not, it causes the attribute to be modified.
- The virtual tape was released using the MARENADM statement FREE-VOLUMES. MAREN causes the attribute to be modified, i.e. MAREN sends console message `MARM1S1` to ROBAR. The message requests a confirmation of whether the attribute modification has taken place.
  If the answer is negative, MAREN cancels the FREE-VOLUMES statement. If the statement included a list of VSNs, the cancellation applies to all the volumes in the statement. The release will have to be repeated for the VSNs that are not affected.

Differences in the release of virtual tapes and real tapes

- A console message that requires a response is sent to ROBAR for each virtual tape that is to be released. Therefore releasing virtual tapes may take somewhat longer than releasing real tapes.
- The data on a virtual tape cannot be recovered following the release of the tape with FREE-VOLUMES. In the case of a real tape, the data will not be lost until the tape is reinitialized or overwritten.
- If a virtual tape is not initialized, the next access must be a write operation at the beginning of the tape. Otherwise the tape will not be consistent and system errors may occur. For that reason, the catalog entry for virtual tapes should contain INIT=YES.

8.3.3 Deleting archive entries

The following applies to MARENADM statements when deleting catalog entries for the virtual tapes of the virtual archive system:

- REMOVE-USER-VOLUMES

  Since virtual tapes cannot be removed, this statement results in the rejection message `MARM015` for the tapes concerned.

- REMOVE-FREE-VOLUMES

  The archive system's free tapes can be removed from the MAREN catalog using this statement.

- DELETE-VOLUME-ENTRY

  This statement deletes MAREN catalog entries for tapes without any checks. The statement is intended for repair use only. If the corresponding tapes are still located in the archive system, there will be discrepancies between the MAREN catalog and the archive system.

8.4 Locations for archive systems

A separate location must be defined for each archive system for the archive systems to be supported by MAREN. That means:

- The archive system must be defined on all systems to which it is connected using the LOCATION-ENTRIES= operand in the MODIFY-MAREN-PARAMETERS statement. The archive system must be set up as the local location with the correct operating mode.
- All tapes in the archive system must be contained in the MAREN catalog with that location as their HOME-LOCATION, FREE- LOCATION and TEMP-LOCATION.
- The tape's archive number and its bar code must be the same in the archive system. If the archive number differs from the bar code, then the tape should be given the proper bar code. If the VSN and the bar code are contained in the MAREN catalog, then it is also possible to modify the VSN to match the bar code. This has the same effect as reinitializing the volume with the following statement:
  `//INITIALIZE-VOLUMES *NONE(VOL=<barcode_vsn>,OLD-VSN=<current_vsn>)`

If several archive systems are used, each has to have its own location name.

In contrast to tapes that are mounted manually, the name of the system is not entered in the TEMP-LOCATION field for the tapes in an archive system.

8.5 Initializing tapes in an archive system

In conjunction with an archive system, MAREN allows tapes to be initialized fully automatically. This also applies to virgin tapes and tapes that do not have a VOL1 label.

The archive number from the bar code label is used.

The following steps are required for the initialization:

1. A device must be allocated on which the archive system is to mount the tapes:

   An explicit reservation is not necessary. MAREN automatically requests a device that is allocated to the location for the initialization. The location is determined either using the archive number explicitly specified or using the INIT-LOCATION operand. If no device is available the initialization is rejected.

   If a device <mn> was explicitly reserved using SECURE-RESOURCE-ALLOCATION UNIT=<mn>, MAREN uses that device. If the device is not allocated to the location, the initialization is rejected and the device continues to be reserved.

2. Start MARENADM:
   `/START-MARENADM`

3. Perform a “release session” for the new tapes in order to create the INIT file required for the initialization:
   `//FREE-VOLUMES VOLUME=*INT(FROM=...,TO=...)`

   Restrict the range of numbers using the FROM and TO operands in order to speed up the process.

4. Start the initialization:
   `//INITIALIZE-VOLUMES DEV=....,INIT-LOC=ROBOLOC1`

   Each tape in turn is initialized.

5. Terminating MARENADM
   `//END`

6. The allocated device is released again:
   `/SECURE-RESOURCE-ALLOCATION`

8.6 Automatic free volume allocation with MARENUCP

If the location for an archive system is contained in the location table (when MARENUCP is started), MARENUCP reserves all tapes requested from the pool of tapes with the attributes HOME-LOCATION=<archivsystem_location> FREE-LOCATION= <archivsystem_location>, TEMP-LOCATION=<archivsystem_location>.

If several archive systems are used, the location which is first in the location table is taken as the standard location (e.g. “ROBOLOC1”).

In mixed mode with manually operated cartridge devices and/or several archive systems, the MAREN administrator must specify via a reservation file (see section “Location management via a reservation file” on page 126f or in the computer center MAREN exit routine MARENEX1 (see page 202) whether another storage location is to be used instead of the default one.

If a MAREN exit routine is used, the following points should be borne in mind:

- In the catalog entry passed to the data center exit routine, the default location “ROBOLOC1” is preset for the HOMELOC catalog entry field.
- If a tape from the manual archive is to be used, a different location must be entered (e.g. “CENTRAL”).
- If a tape from a different archive system is to be used, the name of its storage location must be used (e.g. “VTLSLOC”).

After the reservation, the archive system is requested to mount the tape.

9 MAREN exits

MAREN exits (exits for short) are routines which are called by individual MAREN components at certain stages in processing. These routines allow specific processes in MAREN to be monitored and logged. They also allow the normal behavior of MAREN to be changed and certain steps in processing to be prevented.

MAREN provides the following exits:

- Reserve-request exit MARENEX1 and reserve-return exit MARENEX3, for the function “new tape reservation”
- Write-request exit MARENEX2 and write-return exit MARENEX4 for the function “modify catalog entry”
- Read exit MARENEX5 for the function “access catalog entry”
- Device depot exit MARENEX6 for the function “device selection and location definition”

9.1 Provision of MAREN exits

All the exits used on any system in a MAREN network must be made available as object modules in a module library. This library must be assigned using the link name MARENLIB before the programs MARENCP and MARENUCP are called. When MAREN is started up, these modules, if they are available, are dynamically linked to the control program MARENCP and to MARENUCP via the BIND macro. If one or all of the exits are missing from the object module library, then MAREN starts normally and no error message is issued. If an exit routine is changed and added to the object module library, this change only takes effect when the object module library is closed.

The exits can be switched during ongoing operation by checking whether the assigned object module library has been modified in the case of each request in MARENCP, MARENUCP and MARENADM. When a modification takes place, all loaded exits are reloaded. If an error occurs with the BIND macro (e.g. if the element is locked), BIND is repeated.

If the MARENADM administrator program is used with direct access to the MAREN catalog, a number of the exit routines are also executed. In this event, however, it is not necessary to assign the exit library explicitly as MARENADM fetches the name via a call to the control program. If this library is under a user ID other than the administrators user ID, it must be cataloged with USER-ACCESS=*ALL-USERS.

9.2 Programming rules

The exit routines are executed partially or completely under the system administrator ID TSOS (depending on how the data center is organized). For this reason, special care must be taken while programming. The following rules must be strictly adhered to:

- The program must conform to BS2000 conventions for program linkage, i.e. the start and end must be structured as follows

```
MARENEXn CSECT
         STM 14,12,12(13)
         :
         :
         LM  14,12,12(13)
         BR  14
```

- In an XS environment, the exit routines must contain AMODE ANY and RMODE ANY and conform to the XS programming rules.
- Fields marked in the catalog record (macro MARENA DSECT) as “unused”, “reserved” or as “MAREN-internal field” must not be used by the exit routines. In particular, the fields LAFUNKNM and LAFUNKFL must not be modified.
- Most exits are not permitted to change certain catalog entry fields, since correct processing would not otherwise be guaranteed. If this nevertheless happens, the loaded program is terminated with the message `MARCP27`.

  The catalog entry fields affected are indicated in the descriptions of the individual computer center exits.
- Programming rules are described in the “System Exits” manual [7].

Modification of date fields

Data fields can only be edited in ISO4 format (with four-digit year specification).

9.3 MAREN exits for reserving tapes

There are two different exits for the MAREN function “tape reservation”:

- the request exit allows the reservation request to be checked and rejected if necessary
- the return exit only allows evaluations, since the reservation has already taken place.

The following function names are possible when calling the exits for new reservations:

LAFUNKNM	Action involved
MARENFA2	Implicit reservation by specification of the archive number of a free tape in the ARCHIVE statements SAVE, EXPORT and POOL ADD=<tvsn>.
MARENUCP	Reservation via the automatic free tape allocation facility of MARENs
RESERVE	MAREN statement RESERVE-FREE-VOLUME
RESERVE1	MARENADM statement RESERVE-FREE-VOLUME

Passing parameters

The following information is passed to the individual computer center exits:

Register 1	A(parameter area) The parameter area comprises a word containing the address of the catalog entry. The individual catalog entry fields can be addressed symbolically via the dummy section MARENA.
Register 13	A(Savearea) The save area provided by MAREN is 18 words long.
Register 14	A(return) For returning directly to MAREN.
Register 15	A(exit routine) Start address of the called exit routine.

All other registers are set to “binary zero”.

9.3.1 Reserve-request exit MARENEX1

The reserve-request exit is executed before a tape is reserved.

This allows the MAREN administrator to perform some of the following actions, for example:
– define a range of numbers
– determine locations
– assign values to catalog entry fields or modify these values in advance
– reject free tape requests in certain circumstances
– prevent the reservation of tapes under certain user IDs.

A reservation file created with MARENLM is evaluated before the reserve-request exit.

The following actalog entry fields must not be changed by the reserve-request exit:

LAFUNKFL	Flag for the action to be performed by the program
LAFUNKNM	Name of the calling MAREN components or abbreviated name of the MAREN or MARENADM statement entered
ERRORKEY	error message key

If a reservation request is issued for a tape determined by ARCHIVE as a result of one of the ARCHIVE statements POOL, SAVE or EXPORT (LAFUNKNM= C’MARENFA2’), the following catalog entry fields must also not be changed:

NUMMANFV	internal catalog entry field for start of number range (archive number)
NUMMANFF	internal catalog entry field for start of number range (FSEQ)
NUMMEND	internal catalog entry field for end of number range

If one of these catalog entry fields is changed by the request exit, the loaded program is terminated with message `MARCP27`.

After control has been returned from the system exit, and before the catalog entry is output to the MAREN catalog, certain other catalog entry fields are changed. This means that any presettings relating to these catalog entry fields performed in the exit have no effect. The following list shows the catalog entry fields involved:

TEMPLOC	current location
INITFLAG	initialization flag
ARCHIVNR	VSN
FSEQ	File sequence number
PRUEFZ	Check digit
RESCOUNT	Reservation counter
VSEQ	File section number
STATUS	Tape status
ARCHLEN	Length of the catalog entry
ACCOUNT	Access counter
DOMAIN	domain

Return codes

The reserve-request exit returns the following information via register 15:

Register contents	**Meaning/reaction from MARENCP or MARENUCP**
0	The request should be granted. Reservation is carried out. Any changes to the catalog entry made by the exit are taken into account.
4	The request is to be rejected. Reservation is not carried out. The caller receives message MARCP24 (REQUEST REJECTED BY MAREN ADMINISTRATOR) and the action (e.g. an ADD-FILE-LINK command) or statement involved (e.g. RESERVE-FREE-VOLUMES) is aborted.
8	This value is only evaluated by MARENUCP. The request is rejected by the automatic free tape allocation facility. The operator is responsible for dealing with the corresponding console messages. MARENCP responds in the same way as when return code ’4’ is passed
other	The system responds in the same way as when return code ’4’ is passed.

Preset catalog entry fields

When the catalog entries are transferred to the exit routine, some of the catalog entry fields are preset. This presetting is to a certain extent dependent on whether a free tape is to be transferred via the RESERVE-FREE-VOLUME statement, via the automatic free tape allocation on via an ARCHIVE command.
The preset catalog entry fields and their contents are shown in the following table. Catalog entry fields not listed only contain blanks when the exit routine is called.

The structure of the catalog entry and the contents of the individual catalog entry fields is described in section “Volume catalog” on page 70. The allocation of the catalog entry fields to the field names of the dummy section of the MARENA macro is described in the appendix on page 531.

Presettings for the RESERVE-FREE-VOLUME statement (MAREN and MARENADM)

Catalog entry field	Contents passed to the reserve-request exit
OWNERID	In MAREN: ID of caller In MARENADM: USER-ID setting
OWNERACC	In MAREN: Account number of caller In MARENADM: USER-ID setting
XARCHDAT	Current date in ISO4 format
XFREIDAT	Expiration date in ISO4 format If <integer>: the date is calculated from current date + specified reservation period. If STD*: the date is calculated from current date + system-specific MAREN parameter DEFAULT-FREE-DATE
FILENM41	FILE-NAME setting; if *NONE (default): blanks
DEVICE	Value for DEVICE-TYPE; if *STD (default): value of the system-specific MAREN parameter DEFAULT-DEVICE-TYPE
HOMELOC	Value for HOME-LOCATION; If *STD (default): value of the system-specific MAREN parameter DEFAULT-HOME-LOCATION
FREELOC	See HOMELOC
TEMPLOC	See HOMELOC
SHARE	USER-ACCESS setting
PASSWORD	In MAREN: PASSWORD setting; if NONE (default): 4X'00' In MARENADM: 4X'00' (PASSWORD operand not supported)
FASTATUS	X'40', the encryption of the contents of the FREEPOOL field. The FASTATUS field is not to be used anymore.
FREEPOOL	Value for the free tape pool.
BEMERKG	REMARK setting; if NONE: blanks
USERFELD	In MAREN: USER-FIELD setting; if NONE (default): blanks In MARENADM: blanks (USER-FIELD not supported)
NUMMANFV	FROM setting; if *FIRST (default): blanks
NUMMANFF	CL4'0001'
NUMMEND	TO setting; if *LAST (default): CL6' 999999'
LATSN	Caller' s TSN
CRJOB	Caller’s job name or blanksn (if job name is not specified)
LAFUNKFL	CL2'17' (field must not be modified by the exit)
LAFUNKNM	In MAREN: CL8'RESERVE' In MARENADM: CL8' RESERVE1' (Field must not be modified by the exit)

Presettings for automatic free tape allocation

Catalog entry field	Contents passed to the reserve-request exit
OWNERID	Caller' s user ID; exception: in the case of HSMS tasks, user ID under which the HSMS directory is cataloged.
OWNERACC	Caller' s account number; exception: in the case of HSMS tasks, first account number in the TSOSJOIN entry of the user ID under which the HSMS directory is cataloged. In case of SPOOL output to tape: blanks
XARCHDAT	Current date in ISO4 format
XFREIDAT	Expiration date in ISO4 format calculated from current data + system-specific MAREN parameter DEFAULT-FREE-DATE
FILENM41	File name
CRCATID	Catalog ID from file' s path name if system-specific MAREN parameter CID-UID is set; otherwise blanks
CRUSERID	User ID from file' s path name if system-specific MAREN parameter CID-UID is set; otherwise blanks In the case of an ARCHIVE backup with a directory - alternative to these three fields (FILENM41, CRCATID and CRUSERID)
DIRNAME	Path name of directory used
DEVICE	Specified device type
HOMELOC	– Value of the system-specific parameter DEFAULT-HOME-LOCATION or – Name of the first archive system entered or – Location specification from the MAREN command ADD-MAREN-FILE-ENTRY or location specification from ARCHIVE or HSMS
TEMPLOC	Name of the local system
SHARE	value of the SHARE operand in the ARCHIVE statement
PASSWORD	4X'00'
FASTATUS	X'40', the encryption of the contents of the FREEPOOL field. The FASTATUS field is not to be used anymore.
FREEPOOL	Value for the free tape pool.
NUMMANFV	blanks
NUMMANFF	CL4'0001'
NUMMEND	CL6'999999'
LATSN	Caller' s TSN
CRJOB	Caller’s job name or blanks; with HSMS: REQUEST-NAME
LAFUNKFL	CL2'17' (field must not be modified by the exit)
LAFUNKNM	CL8'MARENUCP' (field must not be modified by the exit)

Catalog entry field	Contents passed to the reserve-request exit
VOLGROUP	Name of the volume group from the MAREN command ADD-MAREN-FILE-ENTRY

Presettings for one of the ARCHIVE statements

a) POOL DIRECTORY = ..., ADD = (<vsn>,...)

b) SAVE or EXPORT with TAPES = (<vsn>,...) or TAPES = POOL and there are still free (“AVAILABLE”) tapes in the directory’s tape pool (if TAPES = POOL was specified and the tape pool is empty, reservation takes place via the automatic free tape allocation facility; see the table above).

Catalog entry field	Contents passed to the reserve-request exit
OWNERID	Caller' s user ID
OWNERACC	Caller' s account number
XARCHDAT	Current date in ISO4 format
XFREIDAT	Expiration date in ISO4 format calculatedf from current data + system-specific MAREN parameter DEFAULT-FREE-DATE
FILENM41	File name
CRCATID	Catalog ID from file' s path name if system-specific MAREN parameter CID-UID is set; otherwise blanks
CRUSERID	User ID from file' s path name if system-specific MAREN parameter CID-UID is set; otherwise blanks In the case of an ARCHIVE backup with a directory - alternative to these three fields (FILENM41, CRCATID and CRUSERID)
DIRNAME	Path name of directory used
DEVICE	Specified device type
SHARE	value of the SHARE operand in the ARCHIVE statement
PASSWORD	4X'00'
FASTATUS	X'40', the encryption of the contents of the FREEPOOL field. The FASTATUS field is not to be used anymore.
FREEPOOL	Value for the free tape pool.
NUMMANFV	Tape' s archive number (field must not be modified by the exit)
NUMMANFF	CL4'0001' (field must not be modified by the exit)
NUMMEND	Tape' s archive number (field must not be modified by the exit)
LATSN	Caller' s TSN

Catalog entry field	Contents passed to the reserve-request exit
CRJOB	Caller' s job name or blanks
LAFUNKFL	CL2'17' (field must not be modified by the exit)
LAFUNKNM	CL8'MARENFA2' (field must not be modified by the exit)

9.3.2 Reserve-return exit MARENEX3

The reserve-return exit is executed when a reservation has been performed. This exit is not executed if the reservation request was rejected for any reason, such as no free tape was available in the specified range of numbers or the reservation was not permitted by the reserve-request exit.

The complete catalog entry for the reserved tape is passed to the return exit, where it can be evaluated. This allows the archive number of the reserved tape (catalog entry field ARCHIVNR) to be used as the VSN in DMS commands.

The return exit must not make any changes to the catalog entry, otherwise MARENCP is terminated with message `MARCP27`.

Return codes

The return codes are not evaluated for the reserve-return exit for reservation.

9.4 MAREN exits when writing a catalog entry

There are two different exits for the MAREN function “modify catalod entry”:

- the request exit allows the intended modification to be checked and rejected if necessary
- the return exit only allows evaluations, since the modification has already taken place.

The following function names are possible when calling the exit for changing archive entries:

LAFUNKNM	**Action involved**
CHECK	MAREN statement CHECK-TSOSCAT TYPE-OF-FILES=*FGG
CHECK1	MARENADM statement CHECK-TSOSCAT TYPE-OF-FILES=*FGG
FREE	MARENADM statement FREE-VOLUMES
GET	MAREN statement EXPORT-VOLUME
GET1	MARENADM statement EXPORT-VOLUME
RECEIVE	MARENADM statement IMPORT-VOLUME
INIT	MARENADM statement INITIALIZE-VOLUMES
MARARCHU	Program MARENADM.ARCHIVE
MARENFA2	Modification of an catalog entry as a result of one of the ARCHIVE statements SAVE, EXPORT, POOL and PURGE.
MARENFA3	Modification of an catalog entry as a result of one of the ARCHIVE statements SAVE/EXPORT.
MARENUCP	Modification of archive entries as a result of the automatic free tape allocation facility in certain cases.
MAREN0C1	DMS-CLOSE
MAREN0E1	DMS reel change
MAREN0E2	DMS reel change
MAREN0NR	NDM device management
MAREN0NS	NDM device management
MAREN0O2	DMS-OPEN
MODIFY	MAREN statement MODIFY-VOLUME-ATTRIBUTES
MODIFY1	MARENADM statement MODIFY-VOLUME-ATTRIBUTES
MODTSET	MAREN statement MODIFY-TAPE-SET-ATTRIBUTES
MODTSET1	MARENADM statementg MODIFY-TAPE-SET-ATTRIBUTES
MOUNT	MAREN statement MOUNT-VOLUME

LAFUNKNM	Action involved
RETURN	MARENADM statement RETURN-VOLUMES
SECFREE	MARENADM statement SECURE-FREE-VOLUMES

Passing parameters

The following information is passed to the write exits:

Register 1	A(parameter area) The parameter area comprises a word containing the address of the catalog entry. The individual catalog entry fields can be addressed symbolically via the dummy section MARENA.
Register 13	A(Savearea) The save area provided by MAREN is 18 words long.
Register 14	A(return) For returning directly to MAREN.
Register 15	A(exit routine) Start address of the called exit routine.

All other registers are set to “binary zero”.

9.4.1 Write-request exit MARENEX2

The write-request exit is called before an catalog entry is modified. It permits the following activities, for example:

- Check what change is to be performed and the action initiating the change.
- Also change particular catalog entry fields.
- Reject modification according to special criteria.

The following catalog entry fields must not be changed by the write-request exit:

LAFUNKFL	Flag for the action to be performed by the program
LAFUNKNM	Name of the calling MAREN components or abbreviated name of the MAREN or MARENADM statement entered
ARCHIVNR	Tape VSN
FSEQ	File sequence number
VSEQ	File section number
NUMMANF	Internal field for passing ISAM keys
ACCOUNT	Access counter
RESCOUNT	Reservation counter
PRUEFZ	Check digit
DEVICE	Device type
STATUS	Tape status
DOMAIN	Domain

If one of these catalog entry fields is changed by the request exit, the loaded program, e.g. MARENCP, is terminated with message `MARCP27`.

If any of the following catalog entry fields is filled with dollar ($) characters, the field is restored to its original value or filled with blanks (LATSN only):

PASSWORD	Password
LAUSERID	User ID of the last access
LAACC	Account number of the last access
LATSN	TSN of the last access

Return codes

The write-request exit returns the following information via register 15:

Register contents	Meaning/reaction from MARENUCP
0	The request should be granted. The catalog entry is modified using any preset values from the exit.
4	The request is to be rejected. The catalog entry is not modified. The caller receives message MARCP24 and the action (e.g. a ADD-FILE-LINK command) or statement involved (e.g. MODIFY-VOLUME-ATTRIBUTES) is aborted.
other	The system responds in the same way as when return code “4” is passed.

9.4.2 Write-return exit MARENEX4

The write-return exit is only executed if a modification has taken place. This exit is not executed if a modification was rejected for any reason, such as the catalog entry is password-protected and the password was not specified or the modification was not permitted by the write-request exit.

The return exit can perform the following action:

- evaluate the changes made.

The return exit must not make any changes to the catalog entry, otherwise the loaded program, e.g. MARENCP, is terminated with message MARCP27.

Return codes

The return code is not evaluated for the write-return exit for modification.

9.5 MARENEX5 - exit for reading an catalog entry

The read exit is called after an catalog entry has been read. It can perform actions such as the following:

- reject transfer of the catalog entry to the caller.
- delete or replace individual items in the catalog entry to be passed to the user. However, these changes only affect the data passed. No changes are made to the catalog entry.
- In the event of a restart, the file expiration date can be set.

The read exit is only used in the MARENCP program and, if direct access to the MARENCAT is possible, by the MARENADM and MARENUCP programs. A list of the function names possible when calling the read exit can be found in the section “Function names in MAREN” on page 534.

The following catalog entry fields are supplied with values in the caller area:

LATSN	TSN of the calling task
LAUSERID	User ID of the calling task
LAACC	Account number of the calling task
LAJOB	Job name of the calling task
LACPU	Name of the system on which the call was issued (HOSTNAME from the MARENCP start procedure)
LAFUNKFL	C'09'
LAFUNKNM	Name of the calling routine
NUMMANFV	VSN
NUMMANFF	File sequence number

If LAFUNKNM=MOUNT (MAREN statement MOUNT-VOLUME) is specified, then the following also applies:

OPENTYP	C'IN' (ACCESS-READ) or C'OU' (ACCESS-WRITE)

If LAFUNKNM=MARENO01 (DMS call OPEN REQUEST) is specified, then the following also applies:

OPENTYP	Mode in which the file is opened
FILENM41	File name
CRCATID	Catalog ID of the file (only if system-specific MAREN parameter CID-UID is set)
CRUSERID	User ID of the file (only if system-specific MAREN parameter CID-UID is set)

Passing parameters

The following information is passed to the read exits:

Register 1	A(parameter area) The parameter area comprises two words, the first containing the address of the catalog entry and the second word containing the address of an area containing information passed to MARENCP by the caller. Both areas can be addressed symbolically via the DSECT MARENA.
Register 13	A(Savearea) The save area provided by MAREN is 18 words long.
Register 14	A(return) For returning directly to MAREN.
Register 15	A(exit routine) Start address of the called exit routine.

All other registers are set to “binary zero”.

Return codes

The read exit returns the following information via register 15:

Register contents	**Meaning**
0	The request should be granted. The catalog entry read is passed to the caller with any changes made by the exit.
4	The request is to be rejected. The catalog entry read is not passed to the caller. The caller receives message MARCP24 and the action (e.g. a ADD-FILE-LINK command) or statement involved (e.g. SHOW-VOLUME-ATTRIBUTES) is aborted.
other	The system responds in the same way as when return code “4” is passed.

9.6 Device depot exit MARENEX6

With the introduction of support for archive systems it became necessary to differentiate between automatically operated devices and devices controlled manually by a human operator. For this reason, device depots were introduced to BS2000 (NDM); these can be managed with the aid of the operator commands ADD-DEVICE-DEPOT, SHOW-DEVICE-DEPOT and REMOVE-DEVICE-DEPOT.

When tapes are requested, the device depot must be specified in addition to the volume type; an appropriate device must be used by NDM. In the case of a scratch application, MARENUCP must also know which location (archive system or manually operated archive) the tape must be selected from for processing.

This exit makes it possible, to define the device depot in which a device is to be used and set the HOME-LOCATION with the same name for tape selection.

A reservation file created with MARENLM is evaluated immediately before the exit for the device depot.

The device depot exit is called in the following cases:

- a command `SECURE-RESOURCE-ALLOCATION DEVICE` without a LOCATION parameter was called
- a scratch request is being processed.

When the call is issued, the following information is passed to the exit or returned by it in the form shown below:

FILENAME	File name (either the file name as specified via a new parameter in the SECURE-RESOURCE-ALLOCATION command, or the DMS file name in case of a DMS scratch request)
LATSN	TSN of the calling task
OWNERID	User ID of the calling task
OWNERACC	Account number of the calling task
CRJOB	Job name of the calling task
LACPU	Name of the system on which the call was issued (HOSTNAME from the MARENCP start procedure)
HOMELOC	Value of the system-specific parameter DEFAULT-HOME-LOC

The catalog entry field USERFELD passes or returns the following (see note):

DEVTYPE	8 Byte	Device type as specified in request
NUMDEV	1 Byte	Number as specified in request
DEPOT1	8 Byte	Suggested device depot
NUM1	1 Byte	Number of devices as specified in request
DEPOT2	8 Byte	empty
NUM2	1 Byte	empty
DEPOT3	8 Byte	empty
NUM3	1 Byte	empty
DEPOT4	8 Byte	empty
NUM4	1 Byte	empty

DEVICE-DEPOT/HOME-LOCATION is defined by the device depot exit. If two or more devices are requested (only possible with the SECURE-RESOURCE-ALLOCATION command), the devices can belong to different device depots.
If more than one device is to be reserved, this is done device by device, because of the internal processing in NDM. The NUMDEV catalog entry field always has the value 1.
Fields DEPOT2/NUM2 through DEPOT4/NUM4 currently have no meaning.

If blanks are returned instead of the location, MARENUCP determines the location from the number range (fields NUMMANFV and NUMMEND). MARENUCP determines the first tape in the number range and designates the tape's FREE-LOCATION as the required location.

The following additional conditions apply:

- Only one number range can be returned for device depot exit MARENEX6, even if more than one device is requested.
- If no tape is found in the number range, message `MARUP97` is output.

Passing parameters

The following information is passed to the device depot exit:

Register 1	A(parameter area) The parameter area comprises a word containing the address of the catalog entry. The individual catalog entry fields can be addressed symbolically via the dummy section MARENA.
Register 13	A(Savearea) The save area provided by MAREN is 18 words long.
Register 14	A(return) For returning directly to MAREN.
Register 15	A(exit routine) Start address of the called exit routine.

All other registers are set to “binary zero”.

Return codes

The device depot exit returns the following return codes in register 15:

Register contents	**Meaning/reaction from MARENUCP**
0	The values contained in the USERFELD field in Depot1-4 and NUM1-4 are to be used. For the format of USERFELD, see above.
other	The following rule applies: – If a tape is specified in DEVTYPE and an archive system is available, the name of the archive system’s location is used as the depot name. If more than one archive system is available, the one specified first in the MAREN location table is used. – Otherwise the location specified in the system-specific DEFAULT-HOME-LOC parameter is used.

Notes

- When a free tape is requested, the exit MARENEX1 is called after MARENEX6. If a location is specified in both cases, the information must not be contradictory.
- Only MARENEX1 can refuse a request (not MARENEX6).
- The location names returned by MARENEX6 must be compatible with the existing device depots.
- The USERFELD catalog entry field is reset to its original contents after the return.

9.7 Example of a exit routine

The example below illustrates how an exit routine and fulfilling the following three particular requirements can be implemented:

1. Under the ID USERID01 no free tapes are to be newly reserved; any request to this effect is to be rejected.
2. The user ID USERID02 should only be assigned those free tapes whose archive number begin with the number ’3’. For these archive entries, the user field should be predefined with the string ’** EXIT-TEST **’. Since the range of numbers cannot be changed for any new reservations via the MAREN-ARCHIVE link (LAFUNKNM=MARENFA2), reservation must be aborted for a archive number which does not begin with the number ’3’.
3. For all new reservations, the administration field should be predefined with the ’MAREN’ string.

```
MARENEX1 CSECT
         STM   14,12,12(13)
         USING MARENEX1,15
         L     7,0(,1)                          GET @(ARCHREC)
         USING MARENA,7
         CLC   OWNERID,CANUID
         BE    CANCEL
         CLC   OWNERID,=CL8'USERID02'
         BNE   RETURN
         CLC   LAFUNKNM,=CL8'MARENFA2'          CALLER=ARCHIVE EXIT?
         BNE   CONTINUE                         IF NOT ->
         CLI   NUMMANFV,C'3'                    VSN O.K.?
         BNE   CANCEL                           IF NOT - REJECT
         B     UPDATE
CONTINUE MVC   NUMMANFV,=CL6'3'                 SET FROM-OPERAND
         MVC   NUMMEND,=CL6'399999'             SET TO-OPERAND
UPDATE   MVC   USERFELD,=CL54'** EXIT-TEST **'
RETURN   MVC   RZFELD,RZTEXT
         LM    14,12,12(13)
         XR    15,15
         BR    14                               NORMAL-RETURN
CANCEL   LM    14,12,12(13)
         LA    15,4                             INDICATE ERROR
         BR    14                               REQUEST CANCEL
CANUID   DC    CL8'USERID01'
RZTEXT   DC    CL8'MAREN'
         LTORG
         MARENA LAYOUT=V8
         END
```

10 MARENADM administrator program

The MARENADM administrator program is the main utility routine used by the MAREN administrator to manage catalog entries in the MAREN catalog and administer MAREN.

In the MAREN manuals the term “MAREN administrator” is used to mean the following:

- Generic term for all MAREN users with administrator rights regardless of whether or not domains are used
- Administrator in the MAREN network without domains

The meaning is apparent from the context. When this is not the case the particular administrator roles are named explicitly:

- ADA (All-Domain Administrator)
- DA (Domain Administrator)
- Administrator without domains.

The gray highlighting in the syntax representations means that the statement or operand is only available to the ADA. The DA cannot see the operand concerned on the SDF interface.

10.1 Starting and terminating

The MARENADM administrator program is normally started using the START-MARENADM command.

The START-MARENADM command can be executed under any user ID with the TAPE-ADMINISTRATION privilege. The SYSMAREN user ID has this privilege by default. When the software product SECOS is used, the TAPE-ADMINISTRATION privilege can be assigned to any user ID.

When SECOS is not in use, MARENADM can be started under any user ID provided systems support activates the group syntax file SYSSDF.MAREN.<ver>.USER which is supplied and has assigned an administrator password (see the MARENADM statements

MODIFY-MAREN-PARAMETERS and MODIFY-GLOBAL-PARAMETERS). MAREN users legitimate themselves as the MAREN administrator by entering the password in their password table (command ADD-PASSWORD).

START-MARENADM	Alias: **MARENADM**
VERSION = ***STD** / <product-version mandatory-man-corr> / <product-version mandatory-man-without-corr> / <product-version without-man-corr>	
,**MONJV** = ***NONE** / <filename 1..54 without-gen-vers>	
,**CPU-LIM**IT = ***JOB-REST** / <integer 1..32767>	

VERSION =
The selected MARENADM version is used.

VERSION = *STD
Before MARENADM is called, the version is set using the SELECT-PRODUCT-VERSION command (in system mode). This set version is used as the default version.

VERSION = <product-version mandatory-man-corr>
Full version identifier.

VERSION = <product-version mandatory-man-without-corr>
Version identifier excluding the correction status.

VERSION = <product-version without-man-corr>
Version identifier excluding the release and correction status.

MONJV =
Specification of a job variable for monitoring the MARENADM run.

MONJV = *NONE
A monitor job variable is not used.

MONJV = <filename 1..54 without-gen-vers>
Explicit specification of the job variable for monitoring the MARENADM run.

CPU-LIMIT =
Maximum CPU time in seconds allocated for the program.

CPU-LIMIT = *JOB-REST
The remaining CPU time is to be used for the job.

CPU-LIMIT = <integer 1..32767 *seconds*>
Only the specified time is to be used.

Terminating MARENADM

MARENADM is terminated by entering the END statement.

10.2 MARENADM in interactive mode and in batch mode

MARENADM can be run in either interactive or batch mode.

MARENADM expects to receive all statements from the system file SYSDTA. SYSDTA is assigned to the terminal during interactive operation, and to the ENTER file during batch operation.

If MARENADM is to be invoked in a procedure, the system file SYSDTA must be assigned with `//ASSIGN-SYSDTA TO=*SYSCMD`.

Error handling in procedures and batch jobs

Information on the progress of a MARENADM request is stored in task switches in procedures and batch jobs. MAREN sets the task switches during execution or when execution has been concluded.

Task switch 30 is set if MARENADM has executed a statement with a warning. Warnings are issued, for example, if an attempt is made to delete an catalog entry which does not exist in the MAREN catalog.

Task switch 31 is set if MARENADM aborts or fails to execute a statement because of an error. This happens, for example, when an attempt is made to output an catalog entry which does not exist in the MAREN catalog, or when no suitable free tape is available for reservation.

The BS2000 command SET-JOB-STEP resets task switches 16-31.

If MARENADM rejects a statement because of a syntax error, or if the statement is aborted or not executed due to a processing error, the spin off is triggered.

10.3 MARENADM statements

MARENADM offers the following statements:

MARENADM statements	Meaning
ADD-FOREIGN-DEVICE-TYPE	Declare foreign device types in MAREN
ADD-FREE-VOLUMES	Enter archive numbers of free tapes in the MAREN catalog
ADD-HOST	Add new system to the MAREN network
ADD-RESERVED-VOLUME	Generate MAREN catalog entries
CHANGE-LOGGING-FILE	Change logging file
CHECK-TSOSCAT	Display differences between MAREN catalog and TSOSCAT
CLOSE-MAREN-FILES	Close MAREN catalog
COPY-VOLUME-CATALOG	Create copy of the current MAREN catalogs
DELETE-VOLUME-ENTRY	Delete catalog entry from the MAREN catalog
EDIT-MAREN-PARAMETERS	Enable guided dialog for MODIFY-MAREN-PARAMETERS
EDIT-VOLUME-ATTRIBUTES	Enable guided dialog for MODIFY-VOLUME-ATTRIBUTES
END	Terminate MARENADM
ENTER-MAREN-PROCEDURE	Start procedure as batch job with MAREN rights
EXPORT-VOLUME	Export tapes from the MAREN catalog
FREE-VOLUMES	Release tapes
IMPORT-FOREIGN-VOLUME	Add free tapes to the MAREN catalog
IMPORT-VOLUME	Import exported tapes
INITIALIZE-VOLUMES	Initialize and release tapes
MODIFY-ADMINISTRATION-SCOPE	Modify administration area
MODIFY-DOMAIN-ASSIGNMENT	Assign system to a different domain
MODIFY-DOMAIN-PARAMETERS	Modify domain-specific MAREN parameters
MODIFY-GLOBAL-PARAMETERS	Modify global MAREN parameters
MODIFY-MAREN-PARAMETERS	Modify system-specific MAREN parameters
MODIFY-TAPE-SET-ATTRIBUTES	Modify attributes of a tape set
MODIFY-VOLUME-ATTRIBUTES	Modify attributes of tapes in the MAREN catalog
OPEN-MAREN-FILES	Unlock and open the MAREN catalog
PRINT-VOLUME-ATTRIBUTES	Create lists with information from the MAREN catalog
REMOVE-FOREIGN-DEVICE-TYPE	Remove foreign device type from MAREN
REMOVE-FREE-VOLUMES	Delete catalog entries of free tapes from the MAREN catalog

(part 1 of 2)

MARENADM statements	Meaning
REMOVE-HOST	Remove system from the MAREN network
REMOVE-USER-VOLUMES	Remove catalog entries of a user from the MAREN catalog
RENAME-FOREIGN-DEVICE-TYPE	Rename foreign device type
RESERVE-FREE-VOLUME	Reserve free tapes
RETURN-TO-PROGRAM	Return to the loaded program
RETURN-VOLUMES	Move tapes to their permanent location
SECURE-FREE-VOLUMES	Flag and relocate free tapes
SHOW-ADMINISTRATION-SCOPE	Show administered domains
SHOW-DOMAIN-PARAMETERS	Show domain-specific parameters
SHOW-FOREIGN-DEVICE-TYPES	Show foreign device types
SHOW-FREE-VOLUMES	Show information about free tapes
SHOW-GLOBAL-PARAMETERS	Show global parameters of a MAREN network
SHOW-MAREN-FILE	Show information of a MAREN catalog file
SHOW-MAREN-PARAMETERS	Show system-specific MAREN parameters
SHOW-MAREN-STATUS	Show status of MAREN
SHOW-VOLUME-ATTRIBUTES	Show information from the MAREN catalog
SHOW-VSNS	Show archive numbers
STOP-CONTROL-PROGRAM	Terminate MAREN control programs
SYSTEM	Switch to BS2000 system mode
UPDATE-MAREN-CATALOG	Update the MAREN catalog
VERIFY-MAREN-CATALOG	Eliminate inconsistencies in the MAREN catalog
WRITE-ACCOUNTING-RECORDS	Create accounting records

(part 2 of 2)

The standard SDF statements which are always available are not described (see the manual “SDF Dialog Interface” [20]).

ADD-FOREIGN-DEVICE-TYPE
Declare foreign device types in MAREN

Privilege ADA, administrator without domains

This statement declares MAREN device types which are not managed by BS2000.

Subsequently tapes of this type can be added to MAREN using ADD-FREE-VOLUME, IMPORT-FOREIGN-VOLUME, or ADD-RESERVED-VOLUME.

Format

ADD-FOREIGN-DEVICE-TYPE	Alias: **ADFDT**
DEVICE-**TYPE** = <structured-name 1..8>	

Operands

DEVICE-TYPE = <structured-name 1..8>
Specifies an arbitrary name under which the foreign device type is administered.
Only names which are unknown to BS2000 may be used. Abbreviations are also allowed.

Notes

- When the expiration date is reached, MAREN immediately releases tapes.
- The free tape administrator MARENUCP does not operate foreign device types.
- The MARENADM statement FREE-VOLUMES does not evaluate the INIT flag.
- The MARENADM statement INIT-VOLUME rejects a foreign device type as DEVICE-TYPE.

ADD-FREE-VOLUMES
Enter archive numbers of free tapes in the MAREN catalog

Privilege ADA, administrator without domains

This statement adds free tapes to the MAREN catalog. Some catalog entry fields can be set at the same time. When domains are used, free tapes are also assigned to the specified domain.

Format

ADD-FREE-VOLUMES Alias: **ADFV**

VOLUME = ***INT**ERVAL(...) / list-poss(10): <vsn>

***INT**ERVAL(...)

FROM = <vsn>

,**TO** = <vsn>

,**INCREMENT** = **1** / <integer 1..999>

,**FREE-LOC**ATION = **CENTRAL** / <alphanum-name 1..8>

,**DEV**ICE**-TYPE** = ***STD** / <structured-name 1..8>

,**FREE-POOL** = ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> / <text 2..32 without-sep>

,**DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

,**INIT**IALIZATION = ***NO** / ***Y**ES(...)

***Y**ES(...)

,**INIT-FI**LE = **MARENADM.INIT-FILE** / ***NONE** / <filename 1..54 without-gen-vers>(...)

<filename 1..54 without-gen-vers>(...)

INIT-LOCATION = ***NONE** / <alphanum-name 1..8>

,**USER-ID**ENTIFICATION = **SYSMAREN** / <name 1..8>

,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>

,**OV**ERFLOW**-CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

Operands

VOLUME =
Archive numbers of the free tapes to be added to the MAREN catalog.

VOLUME = *INTERVAL(...)
The archive numbers of the free tapes are defined by the following operands:

FROM = <vsn>
Archive number defining the lower interval limit. This operand must contain at least one number.

TO = <vsn>
Archive number defining the upper interval limit. This operand must contain at least one number.

INCREMENT = 1 / <integer 1..999>
Increment. The archive numbers to be added are formed by adding the increment to the numerical part, beginning with the lower interval limit (FROM operand), until the upper interval limit (TO operand) is reached.

VOLUME = list-poss(10): <vsn>
Up to ten archive numbers may be specified.

FREE-LOCATION =
Location where the tapes to be added are to be found.

FREE-LOCATION = CENTRAL
Indicates that the tapes are in the central archive.

FREE-LOCATION = <alphanum-name 1..8>
Location name or symbolic location name.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
Tapes of the standard device type specified with the MODIFY-MAREN-PARAMETERS statement (DEFAULT-DEVICE-TYPE operand) are involved.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

FREE-POOL =
Specifies whether the tapes are already assigned to an free tape pool. If this is the case, the relevant pool must be specified.

FREE-POOL = *NO
The tapes are assigned to the free tape pool with the name *NO.

FREE-POOL = *GLOBAL
The tapes are prereserved for general HSMS/ARCHIVE applications under any user ID.

FREE-POOL = *TSOS
The tapes are prereserved for HSMS/ARCHIVE applications under the user ID TSOS.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
The tapes are allocated to the directory specified here. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.

The free tape pool name must begin with *. This must be followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other. If the relevant free tape pool does not yet exist, it will be created. Otherwise, it is extended to include the specified tapes.

The values *STD and *SAME may not be specified.

DOMAIN =
Specifies which domain the free tapes are assigned to.

DOMAIN = *STD-DOMAIN
The free tapes are assigned to the standard domain.

DOMAIN = *OWN
The free tapes are assigned to the user’s own domain.
The user’s own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
The free tapes are assigned to the specified domain.

INITIALIZATION = *NO / *YES(...)
Specifies whether the tapes must be initialized before being used for the first time (e.g. brand new tapes). The default is *NO, i.e. no initialization is required.

INITIALIZATION = *YES(...)
The tapes must be initialized. An output file with preset values for initialization can be created using the INIT-FILE operand. The actual initialization must be performed using the INITIALIZE-VOLUMES statement.

INIT-FILE =
Specifies the file to which the settings for initialization are to be written (output file). The file type is SAM. This file is created only if at least one tape needs to be initialized.

INIT-FILE = MARENADM.INIT-FILE
The initialization file with the default name is generated. This name is also used as the default name for the INITIALIZE-VOLUMES statement.

INIT-FILE = *NONE
No initialization file is generated. In this case the initialization file must be created using the FREE-VOLUMES statement before INIT-VOLUMES is called.

INIT-FILE = <filename 1..54 without-gen-vers>(...)
Name of the output file to be created.

INIT-LOCATION =
Location name or symbolic location name.

INIT-LOCATION = *NONE
The catalog entry field HOME-LOCATION is not modified.

INIT-LOCATION = <alphanum-name 1..8>
This location name is stored in the catalog entry field HOME-LOCATION. After successful initialization and release, the HOME-LOCATION catalog entry field is filled with the content of the FREE-LOCATION catalog entry field.

USER-IDENTIFICATION = SYSMAREN / <name 1..8>
Specifies the user ID to which the tapes in the MAREN catalog are to be assigned until they have been initialized and subsequently released.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number of the specified user ID.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- When entering an interval for the archive numbers, you must ensure that the numeric parts within the two interval limits have the same length and position. The following entries will be rejected:

Entry	Reason for error
*INT(AAA3AA,AA9AAA)	Positions not identical
*INT(AAA3AA,AA99AA)	Lengths not identical
*INT(A3AAA3,A9AAA9)	Positions not clearly defined due to a number of numerical parts
*INT(AAA9AA,AAA3AA)	FROM operand > TO operand
*INT(AAA3AA,BAA9AA)	Non-numeric parts not identical

- The numeric part may be up to six digits in length. The two interval limits may be identical.
- VSNs with less than six characters are padded with trailing blanks.
- If a archive number to be added already exists in the MAREN catalog, a message to this effect is issued and processing is continued with the next archive number.
- Each archive number added is logged.
- When processing has ended, the total number of VSNs added is output.
- To keep administration requirements to a minimum, directory-specific free tape pools should only be configured for a few important directories.

- If tapes which have to be initialized before being used (e.g. brand new tapes) are entered in the MAREN catalog, the parameter INITIALIZATION =*YES must be specified. The tapes are then not identified as free tapes.
  The catalog entry fields have the following default settings:

```
VOL-STATUS = *RESERVED
INIT = *YES
USER-ID = SYSMAREN
ACCOUNT = *NONE
USER-ACC = *OWNER-ONLY
PASSWORD = *YES
```

- The date on which the free tape was entered in the MAREN catalog for the first time is stored in the catalog entry field REGISTRATION-DATE. The statement MODIFY-VOLUME-ATTRIBUTES enables the MAREN administrator to update the date. The date is output using the SHOW-/PRINT-VOLUME-ATTRIBUTES statement.
- Device type TAPE-UxE is not permissible for this statement as free tapes are not encrypted.

Examples

```
//add-free-volume volume=tape01
%  MARM108 MAREN CATALOG ENTRY TAPE01/0001 ADDED
```

The archive number tape01 has been added to the MAREN catalog as a free tape stored. The location is the central archive.
The value set in the system-specific MAREN parameter DEFAULT-DEVICE-TYPE (e.g. TAPE-C4) is entered as the device type.

```
//add-free-vol vol=(corrtp,id0001,id0002),free-loc=system3,dev-type=tape-c4
%  MARM108 MAREN CATALOG ENTRY CORRTP/0001 ADDED
%  MARM108 MAREN CATALOG ENTRY ID0001/0001 ADDED
%  MARM108 MAREN CATALOG ENTRY ID0002/0002 ADDED
%  MARM170 STATEMENT '//ADD-FREE-VOLUMES' PROCESSED
```

Three free tapes for the device type TAPE-C4 have been added and assigned to the location SYSTEM3.

```
//add-free-vol vol=*int(id0001,id0015),dev-type=tape-c4
%  MARM107 MAREN CATALOG ENTRY 'ID0001'/'0001' ALREADY EXISTS
%  MARM107 MAREN CATALOG ENTRY 'ID0002'/'0001' ALREADY EXISTS
%  MARM108 MAREN CATALOG ENTRY 'ID0003'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0004'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0005'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0006'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0007'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0008'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0009'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0010'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0011'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0012'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0013'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0014'/'0001' ADDED
%  MARM108 MAREN CATALOG ENTRY 'ID0015'/'0001' ADDED
%  MARM120 TOTAL OF 13 MAREN CATALOG ENTRIES PROCESSED
%  MARM171 PROCESSING OF STATEMENT '//ADD-FREE-VOLUMES' TERMINATED WITH
ERRORS
```

Of the 15 specified VSNs, only 13 were added since the VSNs id0001 and id0002 already existed in the MAREN catalog.

ADD-HOST
Add new system to the MAREN network

Privilege ADA, administrator without domains

This statement adds a new system to the MAREN network. When domains are used the system is assigned to a domain. The system-specific MAREN parameters are generated for the new system. These parameters can be modified later using the MODIFY-MAREN-PARAMETERS statement.

When domains are used, a system must be added to the MAREN network before MARENCP can be started on this system. Without domains a system can also be added implicitly to the network by MARENCP being started on the system.

Format

ADD-HOST	Alias: **ADHO**
HOST = <alphanum-name 1..8>	
,**PARAM**ETER = ***FROM-OWN-HOST /** <alphanum-name 1..8>	
,**DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>	
,**ALL-DOMAIN-ADMIN** = ***NOT-ALLOWED** / ***UNCH**ANGED / ***ALLOWED**	

Operands

HOST = <alphanum-name 1..8>
Specifies the name of the system which is to be added.

PARAMETER =
Specifies the system from which the system-specific MAREN parameters are taken over.

PARAMETER = *FROM-OWN-HOST
The system-specific parameters are taken over from the user's own system.

PARAMETER = <alphanum-name 1..8>
The system-specific parameters are taken over from the specified system.

DOMAIN =
Domain to which the system is to be assigned.

DOMAIN = *STD-DOMAIN
The system is assigned to the standard domain.

DOMAIN = *OWN
The system is assigned to the user's own domain.
The user's own domain is the domain of the system on which the ADA is currently working

DOMAIN = <alphanum-name 1..8>
The system is assigned to the selected domain.

ALL-DOMAIN-ADMIN =
Defines whether or not the ADA may work on the system. As soon as a system has been released for the ADA, he/she can work on that system.

ALL-DOMAIN-ADMIN = *NOT-ALLOWED
The system is not permitted for the ADA.

ALL-DOMAIN-ADMIN = *UNCHANGED
The setting from the system-specific parameters that have been taken over remains valid.

ALL-DOMAIN-ADMIN = *ALLOWED
The system is released for the ADA.

Notes

When a system is added to a domain, two cases can be distinguished for the domain-specific parameters:

- At least one system exists in the domain.
  The existing domain-specific parameters then also apply for the new system.
- No system exists in the domain.
  The domain-specific parameters are then taken over from the domain to which the system specified in the PARAMETER operand belongs.

ADD-RESERVED-VOLUME
Generate MAREN catalog entries

Privilege ADA, administrator without domains

This statement generates a MAREN catalog entry for a tape which is assigned to a user ID but is not registered in the MAREN catalog.

Format

ADD-RESERVED-**VOL**UME Alias: **ADRV**

VOLUME = <vsn>(...) / ***ALL**(...) / ***BY-TSOSCAT**(...)

<vsn>(...)

USER-IDENTIFICATION = <name 1..8>

,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>

,**PROT**ECTION = ***STD** / ***PAR**AMETERS(...)

***PAR**AMETERS(...)

PASSWORD = ***NONE** / <c-string 1..4> / <x-string 1..8> /
<integer -2147483648..2147483647> / ***SECRET**

,**USER-ACCESS** = ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY / ***ALL-USERS**

,**FREE-DATE** = ***STD** / <date> / <integer 0..32767 *days*>

,**LOC**ATION = ***STD** / ***PAR**AMETERS(...)

***PAR**AMETERS(...)

HOME-LOCATION = **CENTRAL** / <alphanum-name 1..8>

,**FREE-LOC**ATION = **CENTRAL** / <alphanum-name 1..8>

,**TEMP**ORARY-**LOC**ATION = **CENTRAL** / <alphanum-name 1..8>

,**REMARK** = ***NONE** / <c-string 1..24>

,**USER-FIELD** = ***NONE** / <c-string 1..54>

,**ADM**INISTRATOR-**FIELD** = ***NONE** / <c-string 1..8 with-low>

(part 1 of 2)

,**DEVICE-TYPE** = ***STD** / <structured-name 1..8>
,**DIR**ECTORY-**NAME** = ***NONE** / <filename 1..54 without-gen-vers>
,**FI**LE-**NAME** = ***NONE** / <filename 1..41 without-cat-user>
,**FI**LE-**SEQ**UENCE = **1** / <integer 1..9999>
,**VOL**UME-**SEQ**UENCE = **1** / <integer 1..255>
,**NEW-DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

***ALL**(...)
INPUT-FILE = <filename 1..54>
,**DOMAIN** = ***BY-INP**UT-**FI**LE / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>
,**NEW-DOMAIN** = ***STD-DOMAIN** / ***OWN** / ***UNCH**ANGED / <alphanum-name 1..8>

***BY-TSOSCAT**(...)
SELECT = ***ALL** / ***BY-ATTR**IBUTES(...)
***BY-ATTR**IBUTES(...)
FROM = ***FIRST** / <vsn>
,**TO** = ***LAST** / <vsn>
,**PUB**LIC-**VOL**UME-**SET** = ***ALL** / ***HOME** / <cat-id 1..4>
,**USER-ID**ENTIFICATION = ***ALL** / <name 1..8>
,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>
,**PROT**ECTION = ***STD** / ***PAR**AMETERS(...)
***PAR**AMETERS(...)
USER-ACCESS = ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY / ***ALL-USERS**
,**FREE-DATE** = ***STD** / <date> / <integer 0..32767 *days*>
,**LOC**ATION = ***STD** / ***PAR**AMETERS(...)
***PAR**AMETERS(...)
HOME-LOCATION = **CENTRAL** / <alphanum-name 1..8>
,**FREE-LOC**ATION = **CENTRAL** / <alphanum-name 1..8>
,**TEMP**ORARY-**LOC**ATION = **CENTRAL** / <alphanum-name 1..8>
,**ADM**INISTRATOR-**FIELD** = ***NONE** / <c-string 1..8 with-low>
,DOMAIN = ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

(part 2 of 2)

Operands

VOLUME =
Tapes to be added to the MAREN catalog.

VOLUME = <vsn>(...)
Archive number.

USER-IDENTIFICATION = <name 1..8>
User ID to which the volume is to be assigned.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number of the specified user ID.

PROTECTION =
Tape protection attributes.

PROTECTION = *STD
The default values listed below are used.

PROTECTION = *PARAMETERS(...)
Specifies the protection attributes.

PASSWORD = *NONE / <c-string 1..4> / <x-string 1..8> / <integer -2147483648..2147483647> / *SECRET
Password protecting tapes against unauthorized access.

PASSWORD = *NONE
No password is specified.

PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

USER-ACCESS =
Specifies whether foreign user IDs may access the tape.

USER-ACCESS = *OWNER-ONLY
Access to the tape is possible only under the specified user ID.

USER-ACCESS = *FOREIGN-READ-ONLY
Only read access to the tape is possible under a foreign user ID.

USER-ACCESS = *ALL-USERS
Unrestricted access to the tape is possible under a foreign user ID.

FREE-DATE =
Expiration date of the tape. Up to this date, the tape remains reserved for the given user ID.

FREE-DATE = *STD
The reservation period defined by the MAREN administrator applies.

FREE-DATE = <date>
Date in the format `yyyy-mm-dd`.

FREE-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN internally adds this number to the current date to generate the expiration date.

LOCATION =
Location name or symbolic location name.

LOCATION = *STD
The default values listed below are used.

LOCATION = *PARAMETERS(...)

HOME-LOCATION = CENTRAL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the location where the tape is normally to be stored.

FREE-LOCATION = CENTRAL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies location where the tape is to be relocated when it is transferred to the pool of free tapes after the reservation period has expired.

TEMPORARY-LOCATION = CENTRAL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the tape's current location. Archive system locations are not permitted here (does not apply for locations with the operating mode ROBAR-2).

REMARK = *NONE / <c-string 1..24>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

USER-FIELD = *NONE / <c-string 1..54>
Comment text. This catalog entry field may contain any user-specific data, e.g. name, department.

ADMINISTRATOR-FIELD = *NONE / <c-string 1..8 with-low>
Comment text. This field may contain internal information. This catalog entry field cannot be read or changed by the user.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
The tapes are of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified with the MODIFY-MAREN-PARAMETERS statement.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

DIRECTORY-NAME =
Determines whether the tape is assigned to a directory.

DIRECTORY-NAME = *NONE
The tape is not assigned to a directory.

DIRECTORY-NAME = <filename 1..54 without-gen-vers>
Name of a directory to which the tape is assigned. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

FILE-NAME = *NONE / <filename 1..41 without-cat-user>
Name of the file located on the tape.

FILE-SEQUENCE = 1 / <integer 1..9999>
File sequence number of a file within a file set (multifile/multivolume set).

VOLUME-SEQUENCE = 1 / <integer 1..255>
File section number within a multivolume file (MV set).

NEW-DOMAIN =
Domain to which the tape is to be assigned.

NEW-DOMAIN = *STD-DOMAIN
The tape is assigned to the standard domain.

NEW-DOMAIN = *OWN
The tape is assigned to the user’s own domain.
The user’s own domain is the domain of the system on which the ADA is currently working

NEW-DOMAIN = <alphanum-name 1..8>
The tape is assigned to the specified domain.

VOLUME = *ALL(...)
The VSNs of the volumes to be added are to be taken from a file of a domain.

INPUT-FILE = <filename 1..54>
Name of a SAM file containing catalog entries in MAREN format. For instance, this may be an output file created using the SHOW-VOLUME-ATTRIBUTES statement.

DOMAIN =
The tapes of the specified domain are selected.

DOMAIN = *BY-INPUT-FILE
The catalog entries are taken from the domain or domains whose names are contained in a SAM file.

DOMAIN = *OWN
The catalog entries of the user's own domain are selected.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
The catalog entries of the standard domain are selected.

DOMAIN = <alphanum-name 1..8>
The tapes of the specified domain are selected.

NEW-DOMAIN = *STD-DOMAIN / *OWN / *UNCHANGED / <alphanum-name 1..8>
The tapes are assigned to the specified domain.

VOLUME = *BY-TSOSCAT(...)
The archive numbers of the tapes to be added are to be taken from the catalog entries for tape files in the file catalog (TSOSCAT). In this case the MAREN administrator must work under the user ID TSOS.

SELECT =
Criteria for tape selection.

SELECT = *ALL
No restrictions apply to the tapes to be added.

SELECT = *BY-ATTRIBUTES(...)
Only those tapes which fulfill all the following conditions are added.

FROM = *FIRST / <vsn>
Only those tapes whose archive numbers are greater than or equal to the one specified here are added.

FROM = *FIRST
All tapes are added, starting with the lowest available archive number.

TO = *LAST / <vsn>
Only those tapes whose archive numbers are less than or equal to the one specified here are added.

TO = *LAST
All tapes are added up to the highest existing archive number.

PUBLIC-VOLUME-SET =
Specifies the catalog ID of the pubset from whose file catalog for tape files the archive numbers of the tapes to be added to the MAREN catalog are to be taken.

PUBLIC-VOLUME-SET = *ALL
The tapes are taken from the file catalogs of all the available pubsets.

PUBLIC-VOLUME-SET = *HOME
The tapes are only taken from the file catalog of the home pubset.

PUBLIC-VOLUME-SET = <cat-id>
The tapes are taken from the file catalog of the specified pubset.

USER-IDENTIFICATION =
Specifies whether the tapes to be added are to be selected by user ID.

USER-IDENTIFICATION = *ALL
The IDs are not evaluated during selection.

USER-IDENTIFICATION = <name 1..8>
Only tapes from the file entries for tape files under the specified user ID are to be added to the MAREN catalog.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number for the tapes to be added.

PROTECTION =
Protection attributes for the tapes.

PROTECTION = *STD
The default values listed below are used.

PROTECTION = *PARAMETERS(...)

USER-ACCESS =
Specifies whether foreign user IDs may access the tape.

USER-ACCESS = *OWNER-ONLY
Access to the tapes is possible only under the specified user ID.

USER-ACCESS = *FOREIGN-READ-ONLY
Only read access to the tapes is possible under a foreign user ID.

USER-ACCESS = *ALL-USERS
Unrestricted access to the tapes is possible under a foreign user ID.

FREE-DATE =
Expiration date of the tape. Up to this date, the tape remains reserved for the given user ID. If the date specified here is earlier than the file expiration date in the TSOSCAT entry, the tape expiration date is replaced by the corresponding file expiration date.

FREE-DATE = *STD
The reservation period defined by the MAREN administrator applies.

FREE-DATE = <date>
Date in the format `yyyy-mm-dd`.

FREE-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN internally adds this number to the current date to generate the expiration date.

LOCATION =
Location name or symbolic location name.

LOCATION = *STD
The default values listed below are used.

LOCATION = *PARAMETERS(...)

HOME-LOCATION = CENTRAL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the location where the tape is normally to be stored.

FREE-LOCATION = CENTRAL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies location where the tape is to be relocated when it is transferred to the pool of free tapes after the reservation period has expired.

TEMPORARY-LOCATION = CENTRAL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the tape's current location.

ADMINISTRATOR-FIELD = *NONE / <c-string 1..8 with-low>
Comment text. This field may contain internal information. This catalog entry field cannot be read or changed by the user.

DOMAIN = *OWN / *STD-DOMAIN / <alphanum-name 1..8>
The tapes are assigned to the specified domain.

Notes

- The tapes have the catalog entry field VOLUME-STATUS = RESERVED. Catalog entries for free tapes can only be created by means of the statements ADD-FREE-VOLUMES and IMPORT-FOREIGN-VOLUME.
- The FILE-NAME and DIRECTORY-NAME operands may not be entered simultaneously.
- The date on which the user's own tapes are entered in the MAREN catalog for the first time is stored in the catalog entry field REGISTRATION-DATE. The statement MODIFY-VOLUME-ATTRIBUTES enables the MAREN administrator to update the date. The date is output using the SHOW-/PRINT-VOLUME-ATTRIBUTES statement.
- In the case of a tape which was added to the MAREN catalog with DEVICE-TYPE=TAPE-UxE, all read and write accesses must take place with DEVICE=TAPE-UxE. The tape contents are encrypted when they are written. When the tape is released by means of FREE-VOLUMES, the tape type is changed to TAPE-Ux because the device type TAPE-UxE only exists for reserved tapes.
- If the specified expiration date is earlier than the current date or the catalog entry already exists, the statement is aborted with an error message and the spin off is triggered.
- Notes on adding catalog entries by means of a file:
  - The values for VOLUME, FILE-SEQUENCE, VOLUME-SEQUENCE, CHECK-COUNT, ACCESS-COUNT, and RESERVATION-COUNT in the catalog entries to be added are checked for syntax errors.
  - The expiration date is not checked.
  - Passwords with the contents C'$$$$' are converted to NONE (X'00000000').
  - Each catalog entry added is acknowledged.
  - If a catalog entry already exists, the catalog entry from the input file is not added. Instead, the spin off mechanism is triggered and the statement is continued.
  - The sum total of records read and catalog entries added is logged.
  - If an archive system location is specified in the TEMPORARY-LOCATION catalog entry field, this is replaced by the value "CENTRAL" (does not apply for storage locations with the operating mode ROBAR-2).
  - If the assigned input file also contains catalog entries of free and foreign tapes, these are likewise added to the MAREN catalog.

- A MAREN catalog must have a FREE-POOL record for all free tape pools that have been allocated tapes. These FREE-POOL records are set up when starting MAREN. Such records are produced during operation when needed. However, this is not guaranteed when expanding the MAREN catalog beyond one file. The MAREN administrator must take care of this, and we recommend the following procedure:

  1. SHOW-MAREN-PARAMETERS allows the creation of a list of FREE-POOL records of the catalog containing the catalog entries having to be transferred to the target catalog via a file.
  2. All FREE-POOL records in this list that are not already in the target catalog are then added to it. This is done with the `MODIFY-MAREN-PARAMETERS FREE-POOL=*PAR(FREE-POOL=<name>,ACTION=*ADD` statement.
  3. The catalog entries from the file are added to the target catalog (with the statement ADD-RESERVED-VOLUME).
  4. Alle FREE-POOL-Sätze, die im 2. All FREE-POOL records that were added in the second step although they were superfluous are deleted with the `MODIFY-MAREN-PARAMETERS FREE-POOL=*PAR(FREE-POOL=<name>,ACTION=*REMOVE)` statement.

- Notes on adding tapes from TSOSCAT entries for tape files:
  - The operand VOLUME = *BY-TSOSCAT allows a MAREN catalog to be created from all available entries for tape files in TSOSCAT when MAREN is first installed. The operands PUBLIC-VOLUME-SET and USER-IDENTIFICATION allow for selection by catalog or user ID. Because access is permitted to archive entries of foreign user IDs, it makes sense to use this function only under the systems support user ID. Any attempt to execute this statement under a nonprivileged ID will be rejected.
  - As only the file catalogs of the user's own system are used for evaluation, this statement must be executed on each system in the MAREN network.
  - The catalog entries for temporary tape files are ignored, i.e. the tapes contained in such entries are not added to the MAREN catalog.
  - All tapes added to the MAREN catalog are logged. If any of the tapes found in the TSOSCAT entries are already contained in the MAREN catalog, an attempt to add them again is rejected.
  - After the statement has been terminated, the number of tapes added to the MAREN catalog is output.

Examples

```
//add-resserved-volume vol=id0101(user-id=user1,account=hol1,free-date=+100,
   dev-type=tape-c4,remark='Reserved by ADM')
%  MARM108 MAREN CATALOG ENTRY 'ID0101'/'0001' ADDED
```

This statement is used to enter a tape with device type TAPE-C4 under the user ID USER1 in the MAREN catalog. A reservation period of 100 days is defined for the tape. The remark field informs the user that the reservation was made by the administrator.

```
//add-reserved-volume vol=idx002,user-id=user2,account=acc801,pass='xtst'
%  MARM108 MAREN CATALOG ENTRY 'ID0002'/'0001' ADDED
```

The tape with the archive number idx002 is archived under the user ID user2 with the account number acc801. The tape is protected against unauthorized access with the password 'xtst'. The user can access the tape and the catalog entry (e.g. to change the password) if he/she knows the password and enters a corresponding ADD-PASSWORD command.

```
//add-reserved-volume vol=*all(input-file=list.volume.3)
%  MARM107 MAREN CATALOG ENTRY 'ID0001'/'0001' ALREADY EXISTS
%  MARM107 MAREN CATALOG ENTRY 'ID0002'/'0001' ALREADY EXISTS
%  MARM108 MAREN CATALOG ENTRY 'ID0003'/'0001' ADDED
...
%  MARM108 MAREN CATALOG ENTRY 'ID0020'/'0001' ADDED
%  MARM123 20 RECORDS READ FROM FILE 'LIST.VOLUME.3'
%  MARM120 TOTAL OF 18 MAREN CATALOG ENTRIES PROCESSED
%  MARM171 PROCESSING OF STATEMENT '//ADD-RESERVED-VOLUME' TERMINATED WITH
ERRORS
```

All catalog entries found in the file list.volume.3 are added to the MAREN catalog. Since the catalog already contains two of the catalog entries, only 18 entries out of a total of 20 are added.

```
//add-reserved-volume vol=*by-tsoscat(select=*by-attr(from=tls001,to=tls001,
   pub-vol-set=*home,user-id=userxy01),account=mrsy0004,
   prot=*par(user-access=foreign-read,free-date=2020-12-31),
   location=*par(home-loc=robtls,free-loc=robtls),adm-field='12345678')
%  MARM108 MAREN CATALOG ENTRY 'TLS001'/'0001' ADDED
%  MARM105 TOTAL OF 000001 MAREN CATALOG ENTRIES ADDED
%  MARM170 STATEMENT '//ADD-RESERVED-VOLUME *BY-TSOSCAT' PROCESSED
```

All tapes contained in the TSOSCAT entries for tape files under the user ID userxy01 are added to the MAREN catalog and reserved for this user ID.

CHANGE-LOGGING-FILE
Change logging file

Privilege ADA, DA, administrator without domains

This statement closes the previous logging file and opens a new one. The MAREN administrator uses the HOST-NAME operand to specify whether the change of logging file is to apply for his/her own system, for a particular system, or for all systems in a MAREN network.

Format

CHANGE-LOGGING-**FI**LE Alias: **CHLF**

FILE-**NAME** = ***STD** / <filename 1..54> / <partial-filename 2..30>

,**SUP**PORT = ***PUB**LIC-**DISK** / ***PRIVATE-DISK**(...)

***PRIVATE-DISK**(...)
VOLUME = <vsn>
,**DEV**ICE-**TYPE** = <structured-name 1..8>

,**HOST-NAME** = ***OWN** / ***ALL** / <alphanum-name 1..8> / ***ALL-FROM-DOMAIN**(...)

***ALL-FROM-DOMAIN**(...)
DOMAIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

Operands

FILE-NAME =
Name of the new logging file.

FILE-NAME = *STD
The new logging file is created under the name:
`$SYSMAREN.MAREN.LOGGING.yyyymmdd.hhmmss.<systemname>`

`yyyymmdd`	Current date (ISO4 format);
`hhmmss`	Time of day
`<system-name>`	Name of the local system

FILE-NAME = <filename 1..54>
If no user ID is specified in the file name, the new logging file is created under the execution ID of MARENCP.

FILE-NAME = <partial-filename 2..30>
The new logging file is created under the name:
<partial-filename 2..30>yyyymmdd.hhmmss.<systemname>

yyyymmdd	Current date (ISO4 format);
hhmmss	Time of day
<system-name>	Name of the local system

The last character of <partial-filename 2..30> must be a period.
If no user ID is specified in the file name for <partial-filename 2..30>, the new logging file is created under the execution ID of MARENCP.

SUPPORT =
Location of the new logging file.

SUPPORT = *PUBLIC-DISK
The new logging file is to be created on a public disk.

SUPPORT = *PRIVATE-DISK(...)
The new logging file is to be created on a private disk.

VOLUME = <vsn>
VSN of the disk.

DEVICE-TYPE = <structured name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

HOST-NAME =
Specifies the systems for which the logging file is to be changed.

HOST-NAME = *OWN
The logging file is only changed on the local system.
If the ADA has used the MODIFY-ADMINISTRATION-SCOPE DOMAIN=... statement to become the DA of a domain, HOST=*OWN addresses the system which was determined by the HOST operand in the MODIFY-ADMINISTRATION-SCOPE statement.

HOST-NAME = *ALL
When domains are used, the logging file is changed for all systems in a DA’s own domain; for the ADA, the logging files are changed for all systems.

HOST-NAME = <alphanum-name 1..8>
Name of a system.
If the DA enters the name of a system when domains are being used, this system must belong to the DA’s own domain.

HOST-NAME = *ALL-FROM-DOMAIN (...)
The logging file is changed for all systems of a particular domain. This operand may only be used by the ADA.

DOMAIN =
Selects the domain.

DOMAIN = *STD-DOMAIN
The logging file is changed for the systems in the standard domain.

DOMAIN = *OWN
The logging file is changed for the systems in the local domain.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
The logging file is changed for the systems in the specified domain.

Notes

- If the system-specific parameter LOGGING was not set when the MAREN control program was started, no logging file is opened. In this case, execution of the statement is rejected. No logging file is created.
- If other users still have the old log file open, then it will only be closed after these other user accesses the log file for writing.
- New logging entries are always written to the new logging file.
- If the specified file already exists, it is updated. A further check is carried out to ensure that an existing file possesses the attributes required by a MAREN logging file (ACCESS-METHOD= ISAM, KEY-LENGTH=32, KEY-POSITION=5). Otherwise the statement is aborted. If an error occurs when opening the new logging file even though its file attributes are correct, the MARENCP task is terminated abnormally.
- If a file with the specified name does not exist, a new logging file is opened with the same block size and secondary allocation as the current logging file and in the shared update mode. If the new logging file is to be created on an NK4 pubset, the old logging file must have an even-numbered standard block size, e.g. (STD,2).

Example

```
//change-logging-file file-name=:data:$sysmaren.marenlog.14.2
%  MARCP32 MAREN LOGGING FILE ':DATA:$SYSMAREN.MARENLOG.14.2' OPENED
```

The current logging file is closed. MAREN creates a new logging file under the user ID SYSMAREN on the pubset DATA and then opens the file in shared update mode.

CHECK-TSOSCAT
Display differences between MAREN catalog and TSOSCAT

Privilege Administrators who work under TSOS user ID

This statement enables differences which exist between the MAREN catalog and the file catalog (TSOSCAT) with respect to tape files and file generation groups to be determined. The statement also releases occupied tapes with older file generations.

Differences can have the following causes:

– The MAREN catalog contains information which concerns multiple systems
– The MAREN catalog contains unambiguous archive number assignments, but multiple entries with the same file name can exist
– The TSOSCAT can contain multiple file generation entries for one archive number
– Modifications to the TSOSCAT using the EXPORT-FILE command are not automatically transferred to the MAREN catalog

Format

CHECK-TSOSCAT Alias: **CHTS**

TYPE-OF-FILES = ***ANY** (...) / ***FGG**-ONLY(...)

***ANY**(...)

ATTRIBUTES = ***FI**LE-**NAME** / list-poss(7): ***FI**LE-**NAME** / ***USER-ID**ENTIFICATION / ***USER-ACCESS** / ***CRE**ATION-**DATE** / ***EXPIR**ATION-**DATE** / ***LAST-ACCESS-DATE** / ***FIRST-VOL**UME

***FGG**-ONLY(...)

FREE-DATE = ***UNCH**ANGED / ***TODAY** / ***DIALOG**

Operands

TYPE-OF-FILES =
Types of tape files to be checked.

TYPE-OF-FILES = *ANY(...)
Specifies that the catalog entries for all tape files are to be checked (see "Notes on TYPE-OF-FILES = *ANY" on page 251).

ATTRIBUTES = *FILE-NAME / list-poss(7): *FILE-NAME / *USER-IDENTIFICATION / *USER-ACCESS / *CREATION-DATE / *EXPIRATION-DATE / *LAST-ACCESS-DATE / *FIRST-VOLUME
File or tape attributes which are to be checked for discrepancies.

TYPE-OF-FILES = *FGG-ONLY(...)
Specifies that all file generation groups cataloged in TSOSCAT are to be checked to establish whether the MAREN catalog still contains entries for older generations which are no longer contained in TSOSCATE (see "Notes on TYPE-OF-FILES = *FGG-ONLY" on page 251).

FREE-DATE =
Specifies whether older file generations are only to be logged or whether the relevant tapes are also to be released in the MAREN catalog.

FREE-DATE = *UNCHANGED
Older file generations are only logged.

FREE-DATE = *TODAY
Older file generations are logged and the relevant tapes are released.

FREE-DATE = *DIALOG
If an older file generation is found, the complete MAREN catalog entry for the relevant tape is output. The user can then decide whether or not the tape is to be released. If required, execution of the statement can be terminated at this point. The specification DIALOG is not permitted in batch mode.

Notes

Since only the systems support have unrestricted access to the catalog entries under foreign user IDs, use of this statement is only feasible under the TSOS user ID. If the MARENADM statement CHECK-TSOSCAT is entered under a nonprivileged user ID, it is rejected with the message `MARM1CO`.

If the MAREN administrator wants to match TSOSCAT for his/her own user ID, he/she must use the statement with the same name in the MAREN user program.

*Notes on TYPE-OF-FILES = *ANY*

- This function merely logs any differences in the TSOSCAT and MAREN catalog entries of tape files. It does not make any changes to the MAREN catalog. Only those attributes specified explicitly in the ATTRIBUTES operand are compared.
- The associated MAREN catalog entry is read for each tape contained in the TSOSCAT entries for tape files if that tape has actually been written to. If the tape does not exist in the MAREN catalog, if it is entered under another user ID there, or if it is entered as a free tape, a line is output which contains the file name from TSOSCAT followed by the archive number and the note “NOT EXISTING” or “NOT RESERVED”. In this event, the individual attributes are not compared.
- If the tape contains the attribute USER-ACCESS = *FOREIGN-READ-ONLY in the MAREN catalog entry (the tape can be accessed in read mode only from foreign user IDs), comparison of the shareability attribute is suppressed since there is no corresponding value in the TSOSCAT entry.
- No comparisons are carried out for temporary tape files.

*Notes on TYPE-OF-FILES = *FGG-ONLY*

- If entries for file generations which no longer exist in a TSOSCAT cataloged file generation group are found in the MAREN catalog, and FREE-DATE = *UNCHANGED or *TODAY is specified, these entries are logged with the following attributes:
  ```
  VOLUME
  USER-IDENTIFICATION
  FILE-NAME
  CREATION-DATE
  FREE-DATE
  ```
- If FREE-DATE = *TODAY is specified, the expiration date for the tape is replaced by the current date in the MAREN catalog. This reserves the tape for the user's own user ID until the next release run.
- If FREE-DATE = *TODAY or *DIALOG is specified, those tapes whose expiration date has already elapsed are neither output nor modified since they will be released anyway the next time a release run takes place.

- Archive entries are not generated for temporary tape files or for tapes which are not assigned the own user ID in the MAREN catalog.

Examples

```
//check-tsoscat
THE FOLLOWING DIFFERENCES EXIST BETWEEN MAREN CATALOG AND TSOSCAT:
FILENAME IN TSOSCAT                                  VSN /FSEQ  IN MARENCAT
-------------------------------------------------------------------------------
:2OSG:$USER1.TAPE.FILE.2                             M5637K/0001
FILENAME IN TSOSCAT :   TAPE.FILE.2
FILENAME IN MAREN   :   TAPE.FILE.2(1)
-------------------------------------------------------------------------------
:2OSG:$USER1.TAPE.FILE.2(3)                          M5637K/0003
FILENAME IN TSOSCAT :   TAPE.FILE.2(3)
FILENAME IN MAREN   :   TAPE.FILE.2(4)
-------------------------------------------------------------------------------
:DATA:$MAREN005.MRTP0007.001.TAPE.FILE-0             TLS017/0001 NOT RESERVED
-------------------------------------------------------------------------------
:DATA:$MAREN005.MRTP0007.001.TAPE.FILE-1             TLS018/0001 NOT RESERVED
-------------------------------------------------------------------------------
%  MARM170 STATEMENT '//CHECK-TSOSCAT' PROCESSED
```

All differences between the MAREN catalog and TSOSCAT are output to SYSOUT.

```
//check-tsoscat type-of-files=*fgg(free-date=*unch)
THE FOLLOWING MAREN CATALOG ENTRIES HAVE NO CORRESPONDING ENTRIES IN TSOSCAT:
-------------------------------------------------------------------------------
VOLUME  USER-ID   FILE-NAME                                  CR-DATE  FREE-DATE
-------------------------------------------------------------------------------
SLED02 TSOS     MAREN.SAMPLE(*0001)                        <date>   <date>
% MARM170 STATEMENT '//CHECK-TSOSCAT' PROCESSED
```

A check is carried out to establish whether the MAREN catalog contains older file generations than the file generation groups in the file catalog. The names of the older file generation groups are output only to SYSOUT (FREE-DATE=*UNCHANGED).

CLOSE-MAREN-FILES
Close MAREN catalog

Privilege ADA, DA, administrator without domains

This statement closes all opened files of the MAREN catalog. In addition, it temporarily blocks all access to the MAREN catalog via MARENCP. The administrator uses the HOST-NAME operand to specify whether the lock is to apply for his/her own system, for a particular system, or for all systems in a MAREN network.

Format

CLOSE-**MAR**EN-**FI**LES Alias: **CL** / **CLMF**

HOST-NAME = ***OWN** / ***ALL** / <alphanum-name 1..8> / ***ALL-FROM-DOMAIN**(...)

***ALL-FROM-DOMAIN**(...)
DOMAIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

Operands

HOST-NAME =
Specifies the systems for which the files of the MAREN catalog are to be closed.

HOST-NAME = *OWN
The files of the MAREN catalog are only closed for the local system.
If the ADA has used the MODIFY-ADMINISTRATION-SCOPE DOMAIN=... statement to become the DA of a domain, HOST=*OWN addresses the system which was determined by the HOST operand in the MODIFY-ADMINISTRATION-SCOPE statement.

HOST-NAME = *ALL
When domains are used, the files of the MAREN catalog are closed for all systems in a DA's own domain; for the ADA, the files of the MAREN catalog are closed for all systems.

HOST-NAME = <alphanum-name 1..8>
Name of a system.
If the DA enters a system name when domains are being used, this system must belong to the DA's own domain.

HOST-NAME = *ALL-FROM-DOMAIN (...)
The files of the MAREN catalog are closed for systems of particular domains. This operand may only be used by the ADA.

DOMAIN =
Selects the domain.

DOMAIN = *STD-DOMAIN
The files of the MAREN catalog are closed for the systems in the standard domain.

DOMAIN = *OWN
The files of the MAREN catalog are closed for the systems in the local domain. The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
The files of the MAREN catalog are closed for the systems in the specified domain.

Notes

- The volume catalog and the logging file (if any) are closed.
- If the MARENADM program opened the catalog directly, the open files are likewise closed. When carrying out repair work on the MAREN catalog, all other MARENADM applications which have opened the catalog directly must be terminated or the CLOSE-MAREN-FILES statement must also be entered there.
- After the CLOSE-MAREN-FILES statement is executed, only the following MARENADM statements can be executed via the MARENCP:
  `OPEN-MAREN-FILES, SHOW-MAREN-STATUS, STOP-CONTROL-PROGRAM`

  All other MARENADM access attempts via MARENCP, all MAREN access, and all implicit access to the MAREN catalog via MAREN are rejected.
- The MAREN administrator uses the CLOSE-MAREN-FILES statement to prevent access to the MAREN catalog from the local system and from other systems in the MAREN network. When carrying out repair work on the MAREN catalog, the administrator must issue the CLOSE-MAREN-FILES statement for all systems in the MAREN network.
- The catalog lock is lifted by means of the OPEN-MAREN-FILES statement or by rebooting the BS2000 system. However, it is not lifted by rebooting the MARENCP control program or the MAREN subsystem.

Example

```
//close-maren-files host-name=*all
%  MARM118 ALL FILES OF MAREN CATALOG CLOSED
```

When performing repair work, the MAREN administrator closes the opened files of the MAREN catalog on all systems. The MAREN catalog is temporarily locked.

COPY-VOLUME-CATALOG
Create copy of the current MAREN catalogs

Privilege ADA, administrator without domains

The COPY-VOLUME-CATALOG statement allows the MAREN administrator to create a copy of the current volume catalog without the aid of utilities and without having to close the MAREN catalog (CLOSE-MAREN-FILES).

The copy of the volume catalog can also be incorporated in the backups, and is therefore available for any restore operations that prove necessary.

Format

COPY-VOLUME-**CAT**ALOG	Alias: **CPVC**
TO-FILE = ***MARENCVC** / <filename 1..54> ,**TO-CAT**ALOG-**VERS**ION = ***CURRENT** / ***V81** [1]	

[1] The operand value *V81 is obsolete. It can still be specified for compatibility reasons.

Operands

TO-FILE =
File name of the copy of the volume catalog.

TO-FILE = *MARENCVC
The file name and any special file attributes of the backup copy have already been specified using the command ADD-FILE-LINK LINK-NAME = MARENCVC.

TO-FILE = <filename 1..54>
File name of the copy of the volume catalog.

TO-CATALOG-VERSION = *CURRENT
The copy of the volume catalog is created in the format of the current catalog.

Notes

- For performance reasons, the statement should only be executed in direct access on the system with the MAREN catalog.
- If the file specified in the TO-FILE operand does not exist, it is created on public disks with the attributes BUFFER-LENGTH=STD(SIZE=1) and SPACE= RELATIVE(180,180). If it does exist, it is overwritten without prior warning, provided the file attributes allow this.
- If the output file is to possess special attributes, the ADD-FILE-LINK command must first be entered with the link name MARENCVC. The file attributes specified when this command is issued are taken into consideration when the output file is created. In particular, the BLOCK-CONTROL-INFO=*WITHIN-DATA-BLOCK operand must be specified.
- Since the MAREN catalog is usually open when a backup is created in the data center and is therefore not included in this backup, it is advisable to make a copy of the volume catalog before starting the backup run. If the volume catalog were then to be destroyed because of a disk error, it can be restored using the copy and the logging files of the MAREN catalog (see description of the UPDATE-MAREN-CATALOG statement on page 458).

Example

```
//copy-volume-catalog to-file=backup.marencat
%  MARM119 FILE ':TQA2:$TSOS.BACKUP.MARENCAT' WITH 216 RECORDS CREATED
%  MARM170 STATEMENT '//COPY-VOLUME-CATALOG' PROCESSED
```

The current volume catalog is backed up in the BACKUP.MARENCAT file.

DELETE-VOLUME-ENTRY
Delete catalog entry from the MAREN catalog

Privilege ADA, administrator without domains

This statement deletes a MAREN catalog entry without checking and must therefore be used with care. If the tape is still contained in an archive system, this may cause discrepancies between the archive system's archive record and the MAREN catalog.

Format

DELETE-**VOL**UME-**ENTRY**	Alias: **DL** / **DLVE**
VOLUME = <vsn> / <c-string 1..6> / <x-string 1..12> ,**FI**LE-**SEQ**UENCE = ***ALL** / <integer 1..9999>	

Operands

VOLUME = <vsn> / c-string 1..6> / <x-string 1..12>
Archive number of the tape whose MAREN catalog entry is to be deleted.

FILE-SEQUENCE =
Defines which file sequence number of the specified archive number is to be deleted.

FILE-SEQUENCE = *ALL
Defines that all existing file sequence numbers of the specified archive number are to be deleted. If a temporarily locked tape with the same archive number exists, its catalog entry is likewise deleted.

FILE-SEQUENCE = <integer 1..9999>
The catalog entry with the file sequence number specified here is deleted.

Example

```
//delete-volume-entry volume=m5636k
%  MARM106 MAREN CATALOG ENTRY 'M5636K'/'0001' ERASED
%  MARM170 STATEMENT '//DELETE-VOLUME-ENTRY' PROCESSED
```

The catalog entry of tape m5636k is deleted from the MAREN catalog with all of its existing file sequence numbers.

EDIT-MAREN-PARAMETERS
Edit a catalog entry

Privilege ADA, DA, administrator without domains

The EDIT-MAREN-PARAMETERS statement enables the guided dialog for the MODIFY-MAREN-PARAMETERS statement and replaces the default values of the various operands with the current values of the system-specific MAREN parameters.

The EDIT-MAREN-PARAMETERS statement is only permitted in interactive mode. It must not be used in command files (procedure and ENTER files).

If the user does not wish the next statement executed to be MODIFY-MAREN-PARAMETERS, he/she should press the K1 key or enter *CANCEL in the NEXT field and select any other program statement.

If the statement EDIT-MAREN-PARAMETERS is used in unguided dialog, the user is prompted for the next statement by “//” or “%STMT”. Only if the user switches temporarily to guided dialog by entering “?” is the menu for the MODIFY-MAREN-PARAMETERS statement output containing the current values from the catalog entry for the tape.

Format

EDIT-MAREN-PARAMETERS	Alias: **EDITMP**
HOST-NAME = **<u>*OWN</u>** / <alphanum-name 1..8>	

Operands

HOST-NAME = <u>*OWN</u>
The parameters of the user’s own system are to be modified.

HOST-NAME = <alphanum-name 1..8>
The parameters of the user’s own system are to be modified.

Example

```
//edit-maren-parameters host=system2
//?
```

```
PROGRAM  : MARENADM                      STATEMENT: MODIFY-MAREN-PARAMETERS


------------------------------------------------------------------------------
LOCATION-ENTRIES     = *UNCHANGED
VOLUME-ACCESS-CHECKS = *PARAMETERS(
OVERRULE-LOC         = *YES
LOGGING              = *YES
CID-UID              = *NO
MOUNT-CHECK-INTERVAL = 0060
RESERVATION-SEQUENCE = *BY-VSN
OPERATOR-ROLE        = PARAM
MAREN-DEFAULTS       = *PARAMETERS(
RESERVE-DEVICE-TYPES = *UNCHANGED
EXPORT-RESTRICTIONS  = *PARAMETERS(
ARCHIVES-WORK-TIME   = *PARAMETERS(
EXPORT-RECEIPT       = *PRINTER(
LIFE-TIME-LIMITS     = *PARAMETERS(

------------------------------------------------------------------------------
NEXT = +
KEYS : F1=?   F3=*EXIT   F5=*REFRESH   F6=*EXIT-ALL   F8=+   F9=REST-SDF-IN
       F11=*EXECUTE   F12=*CANCEL

MESSAGE:  CMD0175 OTHER OPERATIONS DESIRED? PRESS *EXIT KEY
```

The system-specific MAREN parameters of SYSTEM2 are read, and the current values from them are used as default values for the operands of a MODIFY-MAREN-PARAMETERS statement which immediately follows.

The LOCATION-ENTRIES, RESERVE-DEVICE-TYPES, and FREE-POOL parameters contain the value *UNCHANGED. Changes to these parameters must be specified explicitly.

When the value “24:00” is specified for ARCHIVES-WORK-TIME in the CLOSE-TIME operand, CLOSE-TIME=00:00 is used. OPEN-TIME=00:00 and CLOSE-TIME=00:00 also mean that the archive is open all day.

EDIT-VOLUME-ATTRIBUTES
Enable guided dialog for MODIFY-VOLUME-ATTRIBUTES

Privilege ADA, DA, administrator without domains

This statement activates guided dialog for the MODIFY-VOLUME-ATTRIBUTES command. As far as it is technically possible and makes sense, the predefined default values of the various operands are replaced by values which are valid for the specified tape's catalog entry.

The EDIT-VOLUME-ATTRIBUTES statement is only permitted in interactive mode. It must not be used in command files (procedure and ENTER files).

If the user does not wish the next statement executed to be MODIFY-VOLUME-ATTRIBUTES, he/she should press the K1 key or enter *CANCEL in the NEXT field and select any other MAREN statement.

If the statement EDIT-VOLUME-ATTRIBUTES is used in unguided dialog, the user is prompted for the next statement by "//" or "%STMT". Only if the user switches temporarily to guided dialog by entering "?" is the menu for the MODIFY-VOLUME-ATTRIBUTES statement output containing the current values from the catalog entry for the tape.

Format

EDIT-VOLUME**-ATTRIBUTES**	Alias: **EDIT**
VOLUME = <vsn> ,**FI**LE-**SEQ**UENCE = **1** / <integer 1..9999>	

Operands

VOLUME = <vsn>
Archive number of the tape whose catalog entry is to be modified.

FILE-SEQUENCE = 1 / <integer 1..9999>
Defines which file sequence number of the specified VSN is to be modified.

Example

```
//edit-volume-attributes volume=c0725k
//?
```

```
PROGRAM  : MARENADM                      STATEMENT: MODIFY-VOLUME-ATTRIBUTES


------------------------------------------------------------------------------
VOLUME                = C0725K(
SELECT                = *RESERVED(
ACCOUNT               = M0815ACC
PROTECTION            = *PARAMETERS(
LOCATION              = *PARAMETERS(
REMARK                = 'SF CHECKING              '
REMARK-2              = *NONE
REMARK-3              = *NONE
USER-FIELD            = *NONE
ADMINISTRATOR-FIELD   = '  152856'
ADMINISTR-FIELD-2     = *NONE
EXPORT-ADDRESS        = *NONE
EXPORT-DATE           = *NONE

------------------------------------------------------------------------------
NEXT = +
KEYS : F1=?   F3=*EXIT   F5=*REFRESH   F6=*EXIT-ALL   F8=+   F9=REST-SDF-IN
       F11=*EXECUTE   F12=*CANCEL

MESSAGE:  CMD0175 OTHER OPERATIONS DESIRED? PRESS *EXIT KEY
```

ENTER-MAREN-PROCEDURE
Start procedure as batch job with MAREN rights

Privilege ADA, DA, administrator without domains

This statement starts a procedure as a batch job with the current MAREN authorizations of the calling task. It is not necessary to specify the administrator password or to provide authentication as the All-Domain Administrator in the procedure file or when the procedure is called:

Format

ENTER-MAREN-PROCEDURE Alias: **ENMP**

FROM-FILE = <filename 1..54 without-gen> / ***LIB**RARY-**ELEM**ENT(...)

***LIB**RARY-**ELEM**ENT(...)
LIBRARY = <filename 1..51 without-gen>
,**ELEM**ENT = <composed-name 1..38>(...)
<composed-name 1..38>(...)
VERSION = ***HIGH**EST-**EXIST**ING / <composed-name 1..24>
,**TYPE** = ***STD** / ***BY-LATEST-MODIFICATION** / <alphanum-name 1..8>

,**PROC**EDURE-**PAR**AMETERS = ***NO** / <text 0..1800 with-low>

,**PROC**EDURE-**PASS**WORD = ***NONE** / <x-string 1..8> / <c-string 1..4> /
<integer -2147483648..2147483647> / ***SECRET**

,**CRYPTO-PASS**WORD = ***NONE** / <c-string 1..8> / <x-string 1..16> / ***SECRET**

,**JOB-CLASS** = ***STD** / <name 1..8>

,**JOB-NAME** = ***NO** / <name 1..8>

,**MONJV** = ***NONE** / <filename 1..54 without-gen-vers>

,**JV-PASS**WORD = ***NONE** / <c-string 1..4> / <x-string 1..8> / ***SECRET** / <integer -2147483648..2147483647>

,**JOB-PRIO**RITY = ***STD** / <integer 1..9>

(part 1 of 2)

```
,SCHEDULING-TIME = *STD / *PARAMETERS(...)
    *PARAMETERS(...)
        START = *STD / *SOON / *IMMEDIATELY / *WITHIN(...) / *AT(...) / *EARLIEST(...) / *LATEST(...)
            *WITHIN(...)
                HOURS = 0 / <integer 0..23 hours>
                ,MINUTES = 0 / <integer 0..59 minutes>
            *AT(...)
                DATE = *TODAY / <date>
                ,TIME = <time>
            *EARLIEST(...)
                DATE = *TODAY / <date>
                ,TIME = <time>
            *LATEST(...)
                DATE = *TODAY / <date>
                ,TIME = <time>
,RESOURCES = *PARAMETERS (...)
    *PARAMETERS(...)
        RUN-PRIORITY = *STD / <integer 30..255>
        ,CPU-LIMIT = *STD / *NO / <integer 1..32767 seconds>
        ,SYSLST-LIMIT = *STD / *NO / <integer 0..999999>
,LOGGING = *STD / *YES / *NO
,LISTING = *NO / *YES
,JOB-PARAMETER = *NO / <c-string 1..127>
,SYSTEM-OUTPUT = *STD / *PRINT / *DELETE
,ASSIGN-SYSTEM-FILES = *STD / *PARAMETERS(...)
    *PARAMETERS(...)
        SYSLST = *STD / *PRIMARY / *DUMMY / <filename 1..54>
        ,SYSOUT = *STD / *PRIMARY / *DUMMY / <filename 1..54>
,PROTECTION = *NONE / *CANCEL
```

(part 2 of 2)

Operands

The statement's operands correspond to the operands of the same name in the ENTER-PROCEDURE, see "Commands" manual [5].

The default settings of the command apply for the operands not contained in the statement. MAREN sets the value *YES instead of the default value only for FLUSH-AFTER-SHUTDOWN.

EXPORT-VOLUME
Export tapes from the MAREN catalog

Privilege ADA, DA, administrator without domains

The EXPORT-VOLUME statement has the following functions:

- It labels local tapes as exported in the MAREN catalog.
  For an encrypted tape, a file is also created which contains the tape's encryption data. This file must be transferred to the foreign data center in addition to the tape (separately from the tape if possible). See "Notes" on page 269.
- It labels foreign tapes as returned to the owner in the MAREN catalog.
  In the case of foreign tapes, the catalog entry is removed from the MAREN catalog. In the case of encrypted tapes, the associated encryption data in the key box is also deleted.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

EXPORT-**VOL**UME Alias: **EXV**

```
VOLUME = *BY-FILE(...) / *BY-DIRECTORY(...) / *INTERVAL(...) /
         list-poss(10): <vsn> / *BY-VOLUME-GROUP (...)

  *BY-FILE(...)
      FILE-NAME = <filename 1..41 without-cat-user>
      ,VERSION = *LATEST / <integer -9999..0> / *ALL
      ,USER-IDENTIFICATION = *ALL / <name 1..8>
      ,TYPE-OF-VOLUMES = *VALID (...) / *OBSOLETE / *ANY
          *VALID(...)
              CLOSE-CHECK = *YES / *NO

  *BY-DIRECTORY(...)
      DIRECTORY-NAME = <filename 1..54 without-gen-vers>
      ,SAVE-FILE-ID = *LATEST / <integer -32767..0> / <composed-name 15..15>
```

(part 1 of 2)

```
    *INTERVAL(...)
        FROM = <vsn>
        ,TO = <vsn>
        ,FROM-FSEQ = 1 / <integer 1..9999>
    *BY-VOLUME-GROUP(...)
        VOLUME-GROUP = <text 1..32 without-sep>
,DOMAIN = *ANY / *OWN / *STD-DOMAIN / <alphanum-name 1..8>
,EXPORT-ADDRESS = <c-string 1..50> / *BY-CATALOG
,LAYOUT = *STD / <filename 1..54 without-gen-vers>
```

(part 2 of 2)

Operands

VOLUME =
Archive numbers of the tapes to be exported.

VOLUME = *BY-FILE(...)
All tapes belonging to a file or a tape set are to be exported.

FILE-NAME = <filename 1..41 without-cat-user>
File name to which a tape set is to be exported.

VERSION =
This operand can be used to select a specific version (or status) of the file specified.

VERSION = *LATEST
Selects the latest version of the file (i.e. the last one created).

VERSION = <integer -9999..0>
Specifying 0 here is equivalent to *LATEST, specifying -1 indicates the penultimate file status, etc.

VERSION = *ALL
Selects all the tapes which exist for the specified file name.

USER-IDENTIFICATION =
This operand selects the user ID to which the tapes are assigned (archive entry field USER-ID).

USER-IDENTIFICATION = *ALL
The user IDs are not evaluated during selection.

USER-IDENTIFICATION = <name 1..8>
Only those archive numbers which are assigned to the specified user ID are selected.

TYPE-OF-VOLUMES =
This operand selects the volume sequences (catalog entry field VOLUME-SEQUENCE) within a tape set. These numbers are usually unique. Some numbers may be duplicated following a restart.

TYPE-OF-VOLUMES = *VALID(...)
If a volume sequence occurs more than once in a tape set, the one created most recently is selected.

CLOSE-CHECK =
This operand allows you to select whether the catalog entry field CLOSE-INDICATOR should be evaluated.

CLOSE-CHECK = *YES
If the CLOSE-INDICATOR catalog entry field is not set to CLOSED for one of the tapes in the selected tape set, the statement is rejected.

CLOSE-CHECK = *NO
The CLOSE-INDICATOR catalog entry field is not evaluated.

TYPE-OF-VOLUMES = *OBSOLETE
If tape sequence numbers occur more than once for a tape set, all are selected except the one most recently created.

TYPE-OF-VOLUMES = *ANY
The volume sequences for a tape set are not checked to establish whether they occur more than once.

VOLUME = *BY-DIRECTORY(...)
All tapes listed in the specified directory (as saved files) are exported.

DIRECTORY-NAME = <filename 1..54 without-gen-vers>
Name of the directory. Only reserved tapes assigned to the Pool of the specified directory are selected.
If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

SAVE-FILE-ID =
The tapes that are to be exported are selected using the save file of the directory specified above.

SAVE-FILE-ID = *LATEST
All tapes listed in the last, i.e. most recent save file are selected.

SAVE-FILE-ID = <integer -32767..0>
All tapes listed in the nth save file are selected (the older the save file, the larger the number n). 0 equals *LATEST. Example: if -5 is specified, the tapes are selected from the last save file but five.

SAVE-FILE-ID = <composed-name 15..15>
All tapes in the save file with the specified SAVE-FILE-ID are selected. The SAVE-FILE-ID has the following format: `S.yymmdd.hhmmss`.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are exported.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are exported.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are exported.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

VOLUME = list-poss(10): <vsn>
Archive numbers of the tapes to be exported.

VOLUME = *BY-VOLUME-GROUP(...)
All tapes of the specified volume group are exported.

VOLUME-GROUP = <text 1..32 without-sep>
Specifies the volume group to which a tape must belong for it to be exported. “*” can be entered as the last character. In this case all volume groups which begin with the specified string are selected.

DOMAIN =
The tapes of the selected domain are exported.

DOMAIN = *ANY
The tapes of all domains are exported.

DOMAIN = *OWN
The tapes of the user’s own domain are exported.
The user’s own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
The tapes of the standard domain are exported.

DOMAIN = <alphanum-name 1..8>
The tapes of the specified domain are exported.

EXPORT-ADDRESS = <c-string 1..50> / *BY-CATALOG
Mailing address. Specifies the destination to which the tape is to be sent. If the tape is to be picked up personally, any text to this effect can be specified, e.g. “Mailbox G7”.

EXPORT-ADDRESS = *BY-CATALOG
The mailing address defined in the tape's catalog entry is to be used for exporting.

LAYOUT =
Specifies how the export receipt is to be created if the MAREN administrator did not set the EXPORT-RECEIPT parameter to *NO in the MODIFY-MAREN-PARAMETERS statement.

LAYOUT = *STD
The export receipt is generated with the default layout.

LAYOUT = <filename 1..54 without-gen-vers>
Layout file. The export receipt is created according to the definitions contained in the layout file by the MAREN administrator, see section “Customized layout” on page 62.

Notes

- The MAREN administrator can define whether an export receipt is to be created for every export. This receipt is first written to a file and then printed (if desired).
  The file is saved as `$<userid>.MAREN.EXPORT-RECEIPT.<vsn>`, where `<userid>` is the user ID of the calling task. If the file already exists, it is extended, otherwise, it is created. If immediate printing is specified in MAREN, the file is automatically deleted after it has been printed. If a list containing several VSNs is specified, the file is not printed until the last VSN has been processed. If a tape in a list cannot be exported, the EXPORT statement is aborted.
- If the MAREN administrator has specified that export receipts are to be generated but not immediately printed automatically, what a user is to do with the `MAREN.EXPORT-RECEIPT.<vsn>` file under his/her user ID depends on arrangements in the data center.
- The layout of the export receipt can be designed freely.
- When a local tape is exported, the catalog entry field EXPORT-DATE is supplied internally with the current date, and the catalog entry field TEMPORARY-LOCATION is set to CENTRAL.
- When exporting a foreign tape, the catalog entry is deleted from the MAREN catalog. All existing multifile catalog entries with an FSEQ > 1 are likewise deleted. In the case of an encrypted tape the associated encryption data in the key box is also deleted.
- The specification for the EXPORT-ADDRESS operand is entered in the appropriate catalog entry field.
- In the case of a foreign tape, the catalog entry is deleted but the mailing address specification is still not superfluous, since it is retained in the logging file and may possibly be printed output in the export receipt.

- When exporting a foreign tape, any temporarily locked tape with the same archive number is reactivated. For more details, please refer to the description of the IMPORT-FOREIGN-VOLUME statement.
- The administrator can select the output medium for export receipts using the MAREN parameter EXPORT-RECEIPT (see section “Export receipt” on page 60).
- When this statement is called to export an encrypted home tape, a compiled S procedure with the tape’s encryption data is created implicitly. At the same time the procedure is assigned the following standard file name:
  `S.PRC.MAREN.ENCRYPTION.DATA.<vsn>`.

  The software product SDF-P is required to create the compiled S procedure.

  The MAREN administrator of the remote data center must call this procedure after the IMPORT-FOREIGN-VOLUME statement has been executed and before the encrypted tape contents are read in order to enter the tape’s encryption data into the key box of his/her system.
- With regard to data privacy and data protection, the following must be observed for encrypted tapes when a tape and encryption data are transferred:

  As separate encryption data can be generated for each tape, the tape contents can be encrypted only using the associated procedure file. To prevent the tape plus the encryption data from falling into the wrong hands, the two should be sent separately. The following procedure is recommended:

  ► Send the tape to the partner.

  ► Wait for confirmation of receipt

  ► Send the encryption data (procedure file) to the partner (e.g. by means of File Transfer or by email)

- In the following cases, the statement aborts with an error message and the spin off mechanism is triggered:
  - The tape is not in the MAREN catalog.
  - The tape is currently being processed.
  - The tape has already been exported.
    Exception: The tape is already at the specified address. In this case, a message is displayed and processing continues as normal.
  - The operand EXPORT-ADDRESS=*BY-CATALOG has been specified, but the catalog entry contains no mailing address.
  - All the tapes in a tape set are to be exported and one of the selected catalog entries contains the attribute FILE-SEQUENCE > 1 (i.e. the file specified is not the first on the specified tape).
  - One of the tapes belonging to the tape set is temporarily locked.
  - The tape is assigned to a storage location with the operating mode ROBAR-2. In this case it cannot be moved or exported.
  - The tapes are selected using a save file from HSMS, and at least one tape is temporarily locked or at least one tape is being processed or is temporarily locked.
  - The file specified in the LAYOUT operand does not exist.

Examples

```
//export-volume volume=id0101,exp-addr='hamburg'
%  MARM134 GET VOLUME 'ID0101' FROM CENTRAL ARCHIVE
%  MARM170 STATEMENT '//EXPORT-VOLUME' PROCESSED
```

Tape ID0101 is exported.

```
//export-volume volume=*by-file(f-name=tape.out),exp-addr=*by-cat
%  MARM134 GET VOLUME 'ID0106' FROM CENTRAL ARCHIVE
%  MARM170 STATEMENT '//EXPORT-VOLUME' PROCESSED
```

All tapes used when the tape file TAPE.OUT was last created are exported. The mailing address contained in the catalog entries of these tapes is to be used.

FREE-VOLUMES
Release tapes

Privilege ADA, DA, administrator without domains

This statement releases reserved tapes when their expiration date is reached. Exceptions to this are exported tapes and those tapes undergoing processing at the time.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

FREE-VOLUMES Alias: **FRV**

VOLUME = ***ALL** / ***INT**ERVAL(...) / ***BY-FI**LE(...) / list-poss(10):<vsn> / ***BY-VOL**UME-**GR**OUP(...)

***INT**ERVAL(...)
- **FROM** = ***FIRST** / <vsn>
- ,**TO** = ***LAST** / <vsn>
- ,**FROM-FSEQ** = **1** / <integer 1..9999>

***BY-FI**LE(...)
- **FI**LE-**NAME** = <filename 1..41 without-cat-user>
- ,**VERSION** = ***ALL** / ***LATEST** / <integer -9999..0>
- ,**USER-ID**ENTIFICATION = ***ALL** / <name 1..8>
- ,**TYPE-OF-VOL**UMES = ***ANY** / ***OBSOLETE**

***BY-VOL**UME-**GR**OUP(...)
- **VOL**UME-**GR**OUP = <text 1..32 without-sep>

,**FREE-LOC**ATION = ***ANY** / <alphanum-name 1..8>

,**DOMAIN** = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

,**INIT-FI**LE = **MARENADM.INIT-FILE** / <filename 1..54 without-gen-vers>(...) / ***DUMMY**(...) / ***NONE**

<filename 1..54 without-gen-vers>(...)
- **SELECT** = ***BY-INIT-FLAG** / ***ALL**
- ,**INIT-LOC**ATION = ***NONE** / <alphanum-name 1..8>
- ,**USER-ID**ENTIFICATION = **SYSMAREN** / <name 1..8>
- ,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>

(part 1 of 2)

```
   *DUMMY(...)
      | SELECT = *BY-INIT-FLAG / *ALL
      | ,INIT-LOCATION = *NONE / <alphanum-name 1..8>
      | ,USER-IDENTIFICATION = SYSMAREN / <name 1..8>
      | ,ACCOUNT = *NONE / <alphanum-name 1..8>
,CHECK-DIRECTORY = *YES / *NO
,CHECK-TSOSCAT = *NO / *YES
,OVERFLOW-CONTROL = *BY-PROGRAM / *BY-SYSTEM
```

(part 2 of 2)

Operands

VOLUME =
Tapes from the MAREN catalog which are to be processed.

VOLUME = *ALL
All tapes from this MAREN catalog are to be processed.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

VOLUME = *BY-FILE(...)
All tapes belonging to a file or a tape set are to be processed.

FILE-NAME = <filename 1..41 without-cat-user>
Specifies the file name for which a tape set is to be processed.

VERSION =
This operand can be used to select a specific version (or status) of the specified file for which the associated tapes are to be processed.

VERSION = *ALL
Processes all versions which exist for the specified file name.

VERSION = *LATEST
Processes the latest version of the file (i.e. the last one created).

VERSION = <integer -9999..0>
Specifying 0 is equivalent to specifying *LATEST, specifying -1 indicates the penultimate file status, etc.

USER-IDENTIFICATION =
This operand selects the user ID to which the tapes are assigned (archive entry field USER-ID).

USER-IDENTIFICATION = *ALL
The user IDs are not evaluated during selection.

USER-IDENTIFICATION = <name 1..8>
Only those archive numbers which are assigned to the specified user ID are processed.

TYPE-OF-VOLUMES =
This operand selects the volume sequences (catalog entry field VOLUME-SEQUENCE) within a tape set. These numbers are usually unique. Some numbers may be duplicated following a restart.

TYPE-OF-VOLUMES = *ANY
The volume sequences for a tape set are not checked to establish whether they occur more than once.

TYPE-OF-VOLUMES = *OBSOLETE
If tape sequence numbers occur more than once for a tape set, all are selected except the one most recently created.

VOLUME = list-poss(10):<vsn>
Archive number. Up to ten archive numbers may be specified.

VOLUME = *BY-VOLUME-GROUP(...)
All tapes of the specified volume group are processed.

VOLUME-GROUP = <text 1..32 without-sep>
Specifies the volume group to which a tape must belong for it to be processed. “*” can be entered as the last character. In this case all volume groups which begin with the specified string are selected.

FREE-LOCATION =
Selects according to the location to which the tapes are to be moved (cf. the operand of the same name in the statements MODIFY-VOLUME-ATTRIBUTES on page 322 and ADD-RESERVED-VOLUMES on page 234).
The explicit specification of FREE-LOCATION may not be combined with the VOLUME = *BY-FILE operand.

FREE-LOCATION = *ANY
The tapes of all locations are processed.

FREE-LOCATION = <alphanum-name 1..8>
The tapes of the specified location are processed.

DOMAIN =
The tapes are selected according to domains.

DOMAIN = *ANY
The tapes from all domains are processed.

DOMAIN = *OWN
The tapes of the user’s own domain are processed.
The user’s own domain is the domain of the system on which the ADA is currently working or the domain in which he/she has taken over the DA role.

DOMAIN = *STD-DOMAIN
The tapes of the standard domain are processed.

DOMAIN = <alphanum-name 1..8>
The tapes of the specified domain are processed.

INIT-FILE =
Specifies the file to which the settings for initialization are to be written (output file). The file type is SAM. This file is created only if at least one tape needs to be initialized.

INIT-FILE = MARENADM.INIT-FILE
The initialization file with the default name is generated. This name is also used as the default name for the INITIALIZE-VOLUMES statement.

INIT-FILE = <filename 1..54 without-gen-vers>(...)
Name of the output file to be created.

SELECT =
Specifies which of the released tapes is to be initialized.

SELECT = *BY-INIT-FLAG
Only those tapes whose catalog entries contain INIT=YES are to be initialized, i.e. only those tapes which were written to while protection characteristics were set. Tapes in whose catalog entries the catalog entry field CLOSE-INDICATOR has the value OPENED are also initialized (see notes on page 278).

SELECT = *ALL
All released tapes are to be initialized.

INIT-LOCATION =
Location name or symbolic location name.

INIT-LOCATION = *NONE
The catalog entry field HOME-LOCATION is not modified.

INIT-LOCATION = <alphanum-name 1..8>
This location name is stored in the catalog entry field HOME-LOCATION. After successful initialization and release, the HOME-LOCATION catalog entry field is filled with the content of the FREE-LOCATION catalog entry field.

USER-IDENTIFICATION = SYSMAREN / <name 1..8>
Specifies the user ID to which the tapes in the MAREN catalog are to be assigned until they have been initialized and subsequently finally released.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number of the specified user ID.

INIT-FILE = *DUMMY(...)
No output file is created. The tapes affected are simply assigned to the specified user ID and account number and moved to the desired storage location. If an output file is specified in a subsequent release run, the catalog entries of these tapes are likewise output there and are thus available for initialization.

SELECT =
Specifies which of the released tapes is to be initialized.

SELECT = *BY-INIT-FLAG
Only those tapes whose catalog entries contain INIT=YES are to be initialized, i.e. only those tapes which were written to while protection characteristics were set. Tapes in whose catalog entries the catalog entry field CLOSE-INDICATOR has been assigned the value OPENED are also initialized (see notes).

SELECT = *ALL
All released tapes are to be initialized.

INIT-LOCATION =
Location name or symbolic location name.

INIT-LOCATION = *NONE
The catalog entry field HOME-LOCATION is not modified.

INIT-LOCATION = <alphanum-name 1..8>
This location name is stored in the catalog entry field HOME-LOCATION. After successful initialization and release, the HOME-LOCATION catalog entry field is filled with the content of the FREE-LOCATION catalog entry field.

USER-IDENTIFICATION = SYSMAREN / <name 1..8>
Specifies the user ID to which the tapes in the MAREN catalog are to be assigned until they have been initialized and subsequently finally released.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number of the specified user ID.

INIT-FILE = *NONE
No file is created. Tapes with INIT=YES are likewise released without being initialized. Initialization takes place automatically using MARENUCP. These tapes cannot be reserved using RESERVE-FREE-VOLUMES.

CHECK-DIRECTORY =
Specifies whether or not to check if there is another tape allocated to a directory before the tape is released.

CHECK-DIRECTORY = *YES
A tape that is still allocated to a directory is not released.

CHECK-DIRECTORY = *NO
The tape is released regardless of whether or not it is still allocated to a directory.

CHECK-TSOSCAT =
Defines whether, before the tape is released, a check should be made to see whether tape files contained in the MAREN catalog are also entered in the TSOSCAT.

CHECK-TSOSCAT = *NO
The tape is released irrespective of whether tape files contained in the MAREN catalog are also entered in the TSOSCAT.

CHECK-TSOSCAT = *YES
A check is made to see whether tape files contained in the MAREN catalog are also entered in the TSOSCAT. If this is the case, the calling user ID receives warning MARM220 which must be answered and can continue or abort the action.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- If the INIT-FILE operand is specified, the tapes to be initialized are not released. Instead, the specified catalog entries are modified as follows:

USER-ID	=	User ID (USER-IDENTIFICATION operand)
ACCOUNT	=	Account number (ACCOUNT operand)
HOME-LOCATION	=	Initialization location (INIT-LOCATION operand)
USER-ACCESS	=	OWNER-ONLY
PASSWORD	=	YES
FILE-NAME	=	Blanks

  Subsequent to modification, the entries are written to the specified file. This file should then be used as the input file for a subsequent initialization run using the INITIALIZE-VOLUMES statement.

- The initialization flag is not given the correct value until a tape file is closed or a volume is swapped. If generation of an output tape is aborted, e.g. due to a hardware fault, you will not be able to tell from the catalog entry whether the tape has been written with security attributes. Tapes of this kind have the value OPENED in the CLOSE-INDICATOR catalog entry field of the catalog entry. They should, however, be initialized just in case.
- During the release procedure, the tape status is reset internally from “reserved” to “free”, the contents of the FREE-LOCATION catalog entry field are copied to the HOME-LOCATION field, and the PASSWORD catalog entry field is deleted. All other catalog entry fields remain unchanged until a new reservation is made. Modifying HOME-LOCATION causes the tapes involved to be moved to the location specified in FREE-LOCATION the next time a clear-up run is performed.
- All existing multifile catalog entries with an FSEQ > 1 are deleted.
- If a file name is specified in the FILE-NAME operand, the VOLUME operand must be set to the default value *ALL. If one of the selected catalog entries contains the attribute FILE-SEQ > 1 with this type of file-name-specific release, processing is aborted.

- For performance reasons, in shared mode the FREE-VOLUMES statement should only be executed on the system with the MAREN catalog.
- If a reserved tape is released which was entered in the MAREN catalog with DEVICE-TYPE=TAPE-UxE, MAREN changes the device type to TAPE-Ux because the device type TAPE-UxE does not exist for free tapes.

Examples

Example 1

```
//free-volumes volume=(id4001,tape01,idx005),init-file=*none
%  MARM137 VOLUME 'ID4001' NOW FREE ( USER ID 'USER1', FILE NAME' ' )
%  MARM137 VOLUME 'TAPE01' NOW FREE ( USER ID 'USERXY08', FILE NAME ' ' )
%  MARM137 VOLUME 'IDX005' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM122 TOTAL OF 3 VOLUMES RELEASED
%  MARM170 STATEMENT '//FREE-VOLUMES' PROCESSED
```

The tapes with the specified archive numbers are released, provided their expiration date has elapsed. They can now be used for new reservations.

Example 2

```
//free-vol vol=*int(id5000,id6000),init-file=*none
%  MARM137 VOLUME 'ID5001' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5002' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5003' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5004' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5005' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5008' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5009' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM137 VOLUME 'ID5010' NOW FREE ( USER ID 'USER1', FILE NAME ' ' )
%  MARM122 TOTAL OF 10 VOLUMES RELEASED
%  MARM170 STATEMENT '//FREE-VOLUMES' PROCESSED
```

All tapes whose archive numbers are in the range id5000 to id6000 are released, provided their expiration date has elapsed.

Example 3

```
//free-vol vol=*int(tlt001,tlt020),init-file=maren.init
(select=*by-init-flag,init-loc=robtls,user-id=init0001)
%  MARM130 VOLUME 'TLT001' RELEASED FOR INITIALIZATION; USER ID 'SYSMAREN',
FILE NAME ' ', CURRENT LOCATION 'CENTRAL'
%  MARM130 VOLUME 'TLT002' RELEASED FOR INITIALIZATION; USER ID 'SYSMAREN',
FILE NAME ' ', CURRENT LOCATION 'CENTRAL'
...
%  MARM137 VOLUME 'TLT011' NOW FREE ( USER ID 'INIT0001', FILE NAME ' ' )
%  MARM137 VOLUME 'TLT012' NOW FREE ( USER ID 'INIT0001', FILE NAME ' ' )
...
%  MARM122 TOTAL OF 6 VOLUMES RELEASED
%  MARM119 FILE 'MAREN.INIT' WITH 10 RECORDS CREATED
%  MARM170 STATEMENT '//FREE-VOLUMES' PROCESSED

//show-vol-attr vol=tlt001,information=*normal
VOLUME    = TLT001       FILE-SEQ      = 0001          DEV-TYPE    = TAPE-C5

USER-ID   = INIT0001     HOME-LOCATION = ROBTLS        RESERV-DATE =
ACCOUNT   =              FREE-LOCATION = CENTRAL       FREE-DATE   = <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = CENTRAL       EXPIR-DATE  =
PASSWORD  = C'INIT'     /-0908736029/
EXPORT    = C'                                                 '  /
REMARK /1 = C'                        ' /2 = C'          ' /3 = C' '
USER-FIELD= C'                                                    '
FILE-NAME =
SAVE-FILE =                  SUBSAVE/SEQ =   /    CR-JOB/REQUEST-NA  =
FREE-POOL = *NO                                   CR-CAT-ID          =
VOL-GROUP =                                       CR-USER-ID         =
VOL-SEQ   = 0001       CR-DATE      =             LAST-ACC-DATE      =
FIRST-VOL =            CR-TIME      =             LAST-ACC-TIME      =
CLOSE-IND =            LAST-CL-DATE =             LAST-ACC-USER-ID   =
VOL-STATUS= RESERVED   LAST-CL-TIME =             LAST-ACC-ACCOUNT   =
INIT      = YES        REG-DATE     =             LAST-ACC-JOB-NAME  =
ADM-FIELD = C'        ' /2 = C'               ' LAST-ACC-TSN       =
                                                  LAST-ACC-HOSTNAME  =
                                                  LAST-WRITE-BLK-CNT =
```

```
//show-vol-attr vol=tlt016,information=*normal
VOLUME    = TLT016       FILE-SEQ      = 0001          DEV-TYPE    = TAPE-C5

USER-ID   = INIT0001     HOME-LOCATION = CENTRAL       RESERV-DATE = <date>
ACCOUNT   =              FREE-LOCATION = CENTRAL       FREE-DATE   = <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = CENTRAL       EXPIR-DATE  =
PASSWORD  = NONE
EXPORT    = C'                                                 '  /
REMARK /1 = C'                         ' /2 = C'          ' /3 = C' '
USER-FIELD= C'                                                    '
FILE-NAME =
SAVE-FILE =                  SUBSAVE/SEQ =   /    CR-JOB/REQUEST-NA  =
FREE-POOL = *NO                                   CR-CAT-ID          =
VOL-GROUP =                                       CR-USER-ID         =
VOL-SEQ   = 0001       CR-DATE      =             LAST-ACC-DATE      =
FIRST-VOL =            CR-TIME      =             LAST-ACC-TIME      =
CLOSE-IND =            LAST-CL-DATE =             LAST-ACC-USER-ID   =
VOL-STATUS= FREE       LAST-CL-TIME =             LAST-ACC-ACCOUNT   =
INIT      = NO         REG-DATE     =             LAST-ACC-JOB-NAME  =
ADM-FIELD = C'        ' /2 = C'                ' LAST-ACC-TSN       =
                                                  LAST-ACC-HOSTNAME  =
                                                  LAST-WRITE-BLK-CNT =
```

All tapes between TLT001 and TLT020 whose expiration date has elapsed are released.
All tapes with INIT=NO whose expiration date has elapsed are released (total of 6 with the archive numbers TLT011 to TLT016; see also output of the catalog entryTLT016).
All tapes with INIT=YES whose expiration data has been reached are reserved for the user ID INIT0001. However, they are no longer available to the original user ID. The modified MAREN catalog entries are written to the file MAREN.INIT (total of 10 with the archive numbers TLT001 to TLT010; see also output of the catalog entry TLT001).
If this file is subsequently assigned as an input file in an initialization run (INITIALIZE-VOLUMES statement), the tapes are then first definitively released and are thus available for new reservations.

Example 4

```
//free-vol vol=*by-file(fi-name=sample.dmsfile.1,version=-3),
   init-file=*dummy(select=*all,init-loc=da11loc)
%  MARM130 VOLUME 'GRA002' RELEASED FOR INITIALIZATION; USER ID 'MAREN001',
FILE NAME 'SAMPLE.DMSFILE.1', CURRENT LOCATION 'LOCESSAI'
%  MARM122 TOTAL OF 0 VOLUMES RELEASED
%  MARM170 STATEMENT '//FREE-VOLUMES' PROCESSED

//show-vol-attr vol=gra002, info=*normal
VOLUME    = GRA002       FILE-SEQ      = 0001          DEV-TYPE    =  TAPE-C4

USER-ID   = SYSMAREN     HOME-LOCATION = DA11LOC       RESERV-DATE =  <date>
ACCOUNT   =              FREE-LOCATION = LOCESSAI      FREE-DATE   =  <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = LOCESSAI      EXPIR-DATE  =
PASSWORD  = C'INIT'     X'C9D5C9E3'       /-0908736029/
EXPORT    = C'                                                  '  /
REMARK /1 = C'                        ' /2 = C'          ' /3 = C'          '
USER-FIELD= C'                                                    '
FILE-NAME =
SAVE-FILE =                  SUBSAVE/SEQ =   /    CR-JOB/REQUEST-NA  =
FREE-POOL = *NO                                   CR-CAT-ID          =
VOL-GROUP =                                       CR-USER-ID         =
VOL-SEQ   = 0001       CR-DATE      = <date>      LAST-ACC-DATE      = <date>
FIRST-VOL = GRA002     CR-TIME      = <time>      LAST-ACC-TIME      = <time>
CLOSE-IND = CLOSED     LAST-CL-DATE = <date>      LAST-ACC-USER-ID   =MAREN001
VOL-STATUS= RESERVED   LAST-CL-TIME = <time>      LAST-ACC-ACCOUNT   =MAREN001
INIT      = YES        REG-DATE     = <date>      LAST-ACC-JOB-NAME  =MAREN001
ADM-FIELD = C'        ' /2 = C'                ' LAST-ACC-TSN       =
                                                  LAST-ACC-HOSTNAME  =D049ZE70
                                                  LAST-WRITE-BLK-CNT =
```

The tapes recorded when creating version -3 of the file SAMPLE.DMSFILE.1 whose expiration date has elapsed are reserved to the user ID SYSMAREN (default value) and transported to the storage location da11loc. There is no selection on the basis of the initialization ID in the MAREN catalog entry (SELECT=*ALL). No file is created for a subsequent initialization run.

IMPORT-FOREIGN-VOLUME
Add free tapes to the MAREN catalog

Privilege ADA, DA, administrator without domains

In the MAREN catalog, this statement generates a catalog entry for foreign tapes which have been exported from a remote data center and were previously not known in the local data center. It also allows you to add multifile catalog entries with an FSEQ > 1.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them. Furthermore, the DA can only add a foreign tape if no tape with the same archive number exists in the MAREN catalog or an existing tape with this archive number belongs to the DA's own domain.

When the foreign tape is encrypted, the MAREN administrator must enter it in the MAREN catalog by means of DEVICE-TYPE=TAPE-UxE and then start a procedure to enter this tape's encryption data in the local system's key box.

Format

IMPORT-FOREIGN-VOLUME — Alias: **IMFV**

VOLUME = list-poss(10): <vsn>

,**FI**LE-**SEQ**UENCE = **1** / <integer 1..9999>

,**USER-ID**ENTIFICATION = <name 1..8>

,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>

,**DEV**ICE-**TYPE** = ***STD** / <structured-name 1..8>

,**DIR**ECTORY-**NAME** = ***NONE** / <filename 1..54 without-gen-vers>

,**DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

,**LOC**ATION = **CENTRAL** / <alphanum-name 1..8>

Operands

VOLUME = list-poss(10): <vsn>
Archive numbers of the foreign tapes.

FILE-SEQUENCE = 1 / <integer 1..9999>
File sequence number of a file within a file set (multifile/multivolume set).

USER-IDENTIFICATION = <name 1..8>
User ID to which the tape is to be assigned.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number of the specified user ID.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
The tapes are of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified with the MODIFY-MAREN-PARAMETERS statement.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

DIRECTORY-NAME =
Determines whether the tape is assigned to a directory.

DIRECTORY-NAME = *NONE
The tape is not assigned to a directory.

DIRECTORY-NAME = <filename 1..54 without-gen-vers>
Name of a directory to which the tape is assigned. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

DOMAIN =
Specifies the domain to which a foreign tape is to be added.
If an existing volume belongs to a foreign domain the statement can only be issued by the ADA. The required domain must then be specified.

DOMAIN = *STD-DOMAIN
The foreign tape is added to the standard domain.

DOMAIN = *OWN
The foreign tape is added to the user’s own domain.
The user’s own domain is the domain of the system on which the ADA is currently working or the domain in which he/she has taken over the DA role.

DOMAIN = <alphanum-name 1..8>
The foreign tape is added to the specified domain.

LOCATION = CENTRAL / <alphanum-name 1..8>
Specifies the location of the foreign tape. If a location is assigned which is accessed by a archive system, the TEMP-LOCATION catalog entry fields with CENTRAL and HOME-LOCATION are set to the specified location. In the case of manually controlled locations, all of a tape's locations are set uniformly to the specified value.

Notes

- The generated catalog entries has the catalog entry fields VOLUME-STATUS = PRIVATE and USER-ACCESS = OWNER-ONLY. Catalog entries for free tapes and user's own tapes can only be created by means of the statements ADD-FREE-VOLUMES and ADD-RESERVED-VOLUME.
- If the MAREN checks have also been activated for foreign tapes (MAREN parameter FOREIGN-TAPE-CHECK = YES) or domains are being used, each foreign tape must be made known in MAREN by means of the IMPORT-FOREIGN-VOLUME statement before initial processing takes place.
- After the catalog entry has been created, the user can, if necessary, modify catalog entry fields using the MAREN statement MODIFY-VOLUME-ATTRIBUTES.
- If a foreign tape is to be archived with a archive number which already exists in the MAREN catalog, MARENADM responds as follows:
  - It is asked whether the old tape is to be locked on a temporary basis so that the foreign tape can be added. If the response is affirmative, the FSEQ is set to '*001' for the current tape. This means that the current tape can no longer be requested, although it continues to be displayed by the SHOW-VOLUME-ATTRIBUTES statement. The new tape is added to the MAREN catalog with the valid FSEQ '0001'. Another tape with the same archive number cannot be archived.
  - If MARENADM is executed in batch mode, the statement is rejected.
  - When using the program interface (see section "MARENADM as a subroutine" on page 474), on the other hand, an attempt is made in both interactive mode and batch mode to temporarily lock the existing tape.
  - If a list of tapes is entered in the VOLUME operand, of which one is already contained in the MAREN catalog and should not be locked temporarily, the statement is aborted with an error message.
- The date on which the foreign tape was entered in the MAREN catalog for the first time is stored in the catalog entry field REGISTRATION-DATE. The MARENADM statement MODIFY-VOLUME-ATTRIBUTES enables the administrator to update the date. The date is output using the SHOW-/PRINT-VOLUME-ATTRIBUTES statement.

- When a foreign tape is encrypted, the MAREN administrator must first enter it in the MAREN catalog by means of DEVICE-TYPE=TAPE-UxE. The administrator must then start a procedure to enter this tape's encryption data in the local system's key box. The remote data center generates this procedure implicitly when the EXPORT-VOLUME statement is called, and transfers it to the local data center. This procedure is generated with the file name `S.PRC.MAREN.ENCRYPTION.DATA.<vsn>` on a tape-specific basis.
- As separate encryption data is generated for each tape, its contents can be encrypted only using the associated procedure file. To prevent the tape plus the encryption data from falling into the wrong hands, the two should be sent separately. The recipient must also store the procedure carefully.

Example

```
//import-foreign-vol vol=mbkx07,user-id=user1,dev-type=tape-c4
%  MARM108 MAREN CATALOG ENTRY 'MBKX07'/'0001' ADDED
```

A foreign tape with the archive number MBKX07 is archived in the MAREN catalog for the user ID USER1.

IMPORT-VOLUME
Import exported tapes

Privilege ADA, DA, administrator without domains

When a reserved but exported tape is returned, this statement deletes the export date in the catalog entry. The tape can once again be accessed in the local data center.

Format

IMPORT-VOLUME	Alias: **IMV**
VOLUME = ***INT**ERVAL(...) / list-poss(10): <vsn> ***INT**ERVAL(...) **FROM** = <vsn> ,**TO** = <vsn> ,**FROM-FSEQ** = **1** / <integer 1..9999>	

Operands

VOLUME =
Tapes that have been returned.

VOLUME = *INTERVAL(...)
All tapes whose archive number are in the specified range have been returned.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number have been returned.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number have been returned.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

VOLUME = list-poss(10): <vsn>
Archive number.

Note

When exported tapes are returned, it cannot be excluded that they have been rewritten in the meantime or have been assigned protection criteria. For this reason, the initialization flag (INIT=YES) is always set for the IMPORT-VOLUME statement in the catalog entry.

Example

```
//import-vol vol=xytape
```

The exported tape XYTAPE has been returned. The export date in the catalog entry is deleted.

INITIALIZE-VOLUMES
Initialize and release tapes

Privilege ADA, DA, administrator without domains

This statement is used to initialize and then release tapes which have been included in the output file of tapes to be initialized (INIT-FILE operand) on release with the FREE-VOLUMES statement. An existing archive number can be modified.

Format

INITIALIZE-**VOL**UMES Alias: **INV**

INIT-FILE = **MARENADM.INIT-FILE** / <filename 1..54 without-gen-vers>(...) / ***NONE**(...)

<filename 1..54 without-gen-vers>(...)

INIT-LOCATION = ***ANY** / <alphanum-name 1..8>

,**USER-ID**ENTIFICATION = **SYSMAREN** / ***ANY** / <name 1..8>

,**ACCOUNT** = ***ANY** / <alphanum-name 1..8>

***NONE**(...)

VOLUME = <vsn> (...)

<vsn> (...)

VOLUME-**OWN**ER = ***NO** / ***Y**ES

,**OLD-VSN** = ***SAME** / <vsn>

,**UCON-USER-ID** = ***NONE** / <name 4..4> [1]

,**DEV**ICE-**TYPE** = ***STD** / <structured-name 1..8>

,**ERASE** = ***NO** / ***Y**ES

,**NEW-VOL**UMES = ***NO** / ***Y**ES

,**FORMAT-VOL**UMES = ***NO** / ***Y**ES

,**LABEL-FORMAT** = ***EBCDIC** / ***ISO7**

,**MESS**AGE-**DESTI**NATION = ***CONSOLE** / ***SYSOUT** / ***BOTH** / ***NONE**

[1] The Operand value <name 4..4> is obsolete. It can still be specified for compatibility reasons.

Operands

INIT-FILE =
Name of the file containing the catalog entries for the tapes to be initialized. This file must be created with the FREE-VOLUMES statement.

INIT-FILE = MARENADM.INIT-FILE
The catalog entries are taken from the file `MARENADM.INIT-FILE`.

INIT-FILE = <filename 1..54 without-gen-vers>(...)
Name of the input file.

INIT-LOCATION =
Location or symbolic location name entered in the catalog entry field HOME-LOCATION during the release run. The location name for an archive system must always be specified.

INIT-LOCATION = *ANY
The tape location is not checked.

INIT-LOCATION = <alphanum-name 1..8>
The tapes must belong to the specified location.

USER-IDENTIFICATION =
User ID assigned to the tape during the release run.

USER-IDENTIFICATION = SYSMAREN
The tapes must be assigned to the user ID SYSMAREN.

USER-IDENTIFICATION = *ANY
The user ID of the tapes is not checked.

USER-IDENTIFICATION = <name 1..8>
The tapes must be assigned to the specified user ID.

ACCOUNT =
Account number assigned to the tape during the release run.

ACCOUNT = *ANY
The account number of the volumes is not checked.

ACCOUNT = <alphanum-name 1..8>
The volumes must have the specified account number.

INIT-FILE = *NONE(...)
An input file is not evaluated. This operand can also be used to change a archive number during initialization.

VOLUME = <vsn>(...)
Only the specified tapes are initialized. The device type specified in the subsequent DEVICE-TYPE operand is not evaluated. Private tapes can also be initialized if the EXPIRATION-DATE in the catalog entry has elapsed.

VOLUME-OWNER =
Specifies if an owner will be entered in the tape label.

VOLUME-OWNER = *NO
An owner is not entered in the tape label.

VOLUME-OWNER = *YES
The owner is entered in the tape label.
The statement is only executed for reserved or private tapes.

OLD-VSN =
Specifies the archive number with which the tape was last initialized.

OLD-VSN = *SAME
The tape was last initialized with the same archive number. If there is a VOL1 label, the archive number must be the same.

OLD-VSN = <vsn>
The specified archive number must be in the VOL1 label.

UCON-USER-ID = *NONE
A connection to UCON is set up without authorization name.

The connection to UCON is set up automatically under any user ID for which the TAPE-ADMINISTRATION privilege and the operator role entered in the system-specific MAREN parameters (default: SYSMAREN) have been defined.

The SYSMAREN user ID which is configured with the TAPE-ADMINISTRATION privilege must be assigned the operator role to permit this.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
The tapes are of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified with the MODIFY-MAREN-PARAMETERS statement.

DEVICE-TYPE = <structured-name 1..8>
Device type to be used during initialization (for a list of possible entries, see also manual “System Installation” [6]).

Special features of the individual types:

TAPE-C4	Tapes of type TAPE-C4 are initialized. The current type is retained.
TAPE-C5,-C6	Tapes of type TAPE-C5 and C6 are initialized. The current type is retained.

ERASE = *NO / *YES
Specifies whether all tapes are to be erased through to the end of the tape.

NEW-VOLUMES = *NO / *YES
Specifies whether error handling is to be suppressed when the labels are read. This function is intended for use with new tapes.

FORMAT-VOLUMES =
Specifies whether the tape is to be formatted during initialization, i.e. provided with servo tracks. Normally tapes are supplied with servo tracks anyway, so that formatting is necessary only after a corresponding error (“Servo tracks defective”).

FORMAT-VOLUMES = *NO
No formatting is carried out.

FORMAT-VOLUMES = *YES
Tapes are formatted simultaneously.

LABEL-FORMAT = *EBCDIC / *ISO7
Specifies which code is to be used when writing the labels on the tapes.

LABEL-FORMAT = *EBCDIC
The labels are written in EBCIDIC code.

LABEL-FORMAT = *ISO7
The labels are written in ISO7 code.

MESSAGE-DESTINATION = *CONSOLE / *SYSOUT / *BOTH / *NONE
Specifies the output medium for messages. If *BOTH is specified, messages are output to both SYSOUT and the console. The response to the message `MARM1IO` is expected from SYSOUT if MESSAGE-DESTINATION=*SYSOUT is specified, and from the console if *CONSOLE and *BOTH are specified.

Notes

- The statement evaluates the input file INIT-FILE. It checks whether the file was created using the FREE-VOLUMES or ADD-FREE-VOLUMES statement. If this is not the case, initialization is aborted.
  The parameters INIT-LOCATION, USER-ID, and ACCOUNT are checked for each tape. The following values which are set by the release run are also checked to ensure that they have not changed:
  ```
  USER-ACCESS = *OWNER-ONLY
  INITIALIZATION = *YES
  LAST-ACC-FUN-NAME = FREE
  ```
  When a check is negative, the statement is aborted for safety's sake.
- The operator is requested by messages to mount the tapes on free tape devices which correspond to the specified device type.

  He/She can mount one tape after another or several simultaneously. The order is arbitrary. The system automatically recognizes which tapes have been mounted. These tapes are initialized and released in the MAREN catalog.
- The tape device is unloaded after initialization and the operator is requested to mount the rest of the tapes. As long as no tape is mounted, this request is repeated periodically.
- Tapes containing no default labels are not recognized. The operator is requested to enter the archive number of the tape.

  The subsequent message `NKVT013` must be acknowledged by the operator with `tsn.mn` if the correct tape is still mounted on the tape device.
- When tapes of an archive system are to be initialized, the information in the section "Initializing tapes in an archive system" on page 196 must be observed.
- If tapes are provided in a magazine, the magazine must be set to automatic mode.
- If device errors occur during initialization, the relevant BS2000 messages must be dealt with.
- If initialization is unsuccessful, analysis of the console dialog (CONSLOG) frequently helps to determine the reason for this.

- Processing of the statement can be terminated properly prematurely.
  - Processing in a dialog task can be terminated after the program interrupt using the `/INFORM-PROGRAM MSG='STOP-INIT'` command.
  - Processing as a batch job can be terminated by systems support from another task using the `/INFORM-PROGRAM MSG='STOP-INIT',JOB-ID= *TSN(TSN=<tsn>)` command.

  Neither of these options affects the current initialization process.
- Up to 20,000 tapes can be initialized by this statement. If the input file contains more than 20,000 catalog entries, any additional catalog entries are ignored.
- If ERASE=*YES and/or FORMAT-VOLUME=*YES is/are specified, the connection to UCON is interrupted because processing take longer.
- The tapes are also erased when ERASE = *NO is specified if the INITIALIZATION = ERASE parameter had already been set in the MODIFY-TAPE-SET-ATTRIBUTES or MODIFY-VOLUME-ATTRIBUTES statement.

Example

The following ENTER file contains a release run with subsequent initialization:

```
/.marenini set-logon-parameters user-id=tsos
/start-marenadm
//free-volumes init-file=maren.initfile
//init-volumes init-file=maren.initfile
//end
/exit-job
```

MODIFY-ADMINISTRATION-SCOPE
Modify administration area

Privilege ADA, DA

This statement is used to change the administration area. This change remains effective until MARENADM is terminated or the statement is entered again.

The DA can enter the statement without operands, thus becoming the ADA. The ADA, on the other hand, becomes the DA of a domain.

Format

MODIFY-ADMINISTRATION**-SCOPE** Alias: **MDAS**

DOMAIN = ***OWN** / ***ALL /** <alphanum-name 1..8>(...) / ***STD-DOMAIN**(...)

<alphanum-name 1..8>(...)
HOST= *FIRST / <alphanum-name 1..8>(...)

***STD-DOMAIN**(...)
HOST = *FIRST / <alphanum-name 1..8>(...)

Operands

DOMAIN =
Specifies a domain.

DOMAIN = *OWN
The ADA becomes the DA of the user's own domain (default value: ADA).
The user's own domain is the domain of the system on which the ADA is currently working.
The system-specific MAREN parameters of the local system apply.

DOMAIN = *ALL
The DA becomes the ADA (default value for DA).
The system-specific MAREN parameters of the local system apply.

The following requirements must be met:

- The system which is being used has been allowed using the statement MODIFY-MAREN-PARAMETERS ALL-DOMAIN-ADMIN = *ALLOWED.
- A password specified with MODIFY-GLOBAL-PARAMETERS ALL-DOMAIN-ADM-PASSW = ... has already been specified with the command ADD-PASSWORD.

DOMAIN = <alphanum-name 1..8> (...)
The ADA becomes the DA of the selected domain.

HOST =
Defines which system-specific MAREN parameters are to be valid for the subsequent statements.

HOST = *FIRST
The system-specific MAREN parameters of the first system (in the alphabetical order of the names) in the specified domain are valid.

HOST = <alphanum-name 1..8> (...)
The system-specific MAREN parameters of the selected system in the specified domain are valid.

DOMAIN = *STD-DOMAIN (...)
The ADA becomes the DA of the standard domain.

HOST =
Defines which system-specific MAREN parameters are to be valid for the subsequent statements.

HOST = *FIRST
The system-specific MAREN parameters of the first system (in the alphabetical order of the names) of the standard domain are valid.

HOST = <alphanum-name 1..8> (...)
The system-specific MAREN parameters of the selected system in the standard domain are valid.

MODIFY-DOMAIN-ASSIGNMENT
Assign system to a different domain

Privilege ADA

This statement assigns a system to another domain. The new assignment is stored in the domain-specific MAREN parameters. The current assignment of tapes to a domain is not changed here. Tapes can remain assigned to a domain even though no system is now assigned to this domain.

When a system is assigned to a new domain, as distinction must be made between two cases:

- At least one system exists in the domain.
  The existing domain-specific MAREN parameters then also apply for the new system.
- No system exists in the domain.
  The domain-specific MAREN parameters are then taken over from the domain to which the system specified in HOST belongs.

Format

MODIFY-DOMAIN-ASSIGNMENT	Alias: **MDDA**
HOST = <alphanum-name 1..8> ,**NEW-DOMAIN** = ***UNCH**ANGED / ***STD-DOMAIN /** <alphanum-name 1..8>	

Operands

HOST = <alphanum-name 1..8>
Specifies the name of the system which is assigned to a different domain.

NEW-DOMAIN =
Defines which domain the system is assigned to.

NEW-DOMAIN = *UNCHANGED
The current assignment of the system to a domain is retained.

NEW-DOMAIN = *STD-DOMAIN
The system is assigned to the standard domain.

NEW-DOMAIN = <alphanum-name 1..8>
The system is assigned to the selected domain.

MODIFY-DOMAIN-PARAMETERS
Modify domain-specific MAREN parameters

Privilege ADA

This statement is used to define or modify the domain-specific MAREN parameters.

The default value *UNCHANGED in the corresponding operands signifies that the previous declaration is applicable.

Format

MODIFY-**DOMAIN-PARAM**ETERS	Alias: **MDDP**
DOMAIN = ***STD-DOMAIN** / ***OWN** / ***ALL** / <alphanum-name 1..8> ,**FREE-VOL**UMES = ***UNCH**ANGED / ***FROM-OWN-DOMAIN / *FROM-STD-DOMAIN**	

Operands

DOMAIN =
Defines the domain whose domain-specific MAREN parameters are to be defined or modified.

DOMAIN = *STD-DOMAIN
The domain-specific MAREN parameters are assigned to the standard domain.

DOMAIN = *OWN
The domain-specific MAREN parameters are assigned to the user's own domain.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *ALL
The domain-specific MAREN parameters are assigned to all domains.

DOMAIN = <alphanum-name 1..8>
The domain-specific MAREN parameters are assigned to the selected domain.

FREE-VOLUMES = *UNCHANGED / *FROM-OWN-DOMAIN / *FROM-STD-DOMAIN
Defines the domain from which free tapes are to be taken when making a reservation or to which domain released tapes are assigned.

FREE-VOLUMES = *FROM-OWN-DOMAIN
Free tapes are taken from or assigned to the user's own domain.

FREE-VOLUMES = *FROM-STD-DOMAIN
Free tapes are taken from or assigned to the standard domain.

MODIFY-GLOBAL-PARAMETERS
Modify global MAREN parameters

Privilege ADA, administrator without domains

This statement is used to define or modify the global MAREN parameters of a MAREN network.

The default value *UNCHANGED in the corresponding operands signifies that the previous declaration is applicable.

Format

MODIFY-**GLOBAL-PARAM**ETERS	Alias: **MDGP**
DOMAIN-PROTECTION = *UNCHANGED / ***ACTIVE / ***NON-ACTIVE** ,**ALL-DOMAIN-ADM-PASSW** = ***UNCH**ANGED / ***NONE** / ***SECRET** / <c-string 1..4> / <x-string 1..8> / <integer -2147483648..2147483647> **,ACCESS-MODE = *UNCH**ANGED / ***SHARED** / ***EXCLUSIVE**	

Operands

DOMAIN-PROTECTION =
Specifies whether domains are used.

DOMAIN-PROTECTION = *ACTIVE
Defines that domains are used. The change takes effect immediately. MAREN need not be reloaded.

DOMAIN-PROTECTION = *NON-ACTIVE
Defines that no domains are used. The change takes effect immediately.

ALL-DOMAIN-ADM-PASSW = *UNCHANGED / *NONE / *SECRET / <c-string 1..4> / <x-string 1..8> / <integer -2147483648..2147483647>
Defines whether the ADA must be legitimated with a password. The password must be specified using the ADD-PASSWORD command.

ALL-DOMAIN-ADM-PASSW = *NONE
No password is required.

ALL-DOMAIN-ADM-PASSW = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

ACCESS-MODE =
Defines the mode for accessing the MAREN catalog.

See section “Selecting the mode” on page 49.

ACCESS-MODE = *SHARED
Defines shared mode as the access method (see page 47).

ACCESS-MODE = *EXCLUSIVE
Defines exclusive mode as the access method (see page 48).

MODIFY-MAREN-PARAMETERS
Modify system-specific MAREN parameters

Privilege ADA, DA, administrator without domains

This statement is used to define or modify the system-specific MAREN parameters of a BS2000 system.

When a MAREN parameter is modified on the local system using this statement, this modification becomes effective immediately.

This modification becomes effective on the other systems of the MAREN network from the time when the MAREN control program executing there first reads the modified parameter set. This occurs, for example, when the MAREN administrator has entered the SHOW-MAREN-PARAMETERS statement.

The default value *UNCHANGED in the corresponding operands signifies that the previous declaration is applicable.

Format

MODIFY-**MAR**EN-**PAR**AMETERS Alias: **MDMP**

LOCATION-**ENTRIES** = ***UNCH**ANGED / ***PAR**AMETERS(...)
  ***PAR**AMETERS(...)
    LOCATION-**NAME** = <alphanum-name 1..8>
    ,**ACTION** = ***ADD** (...) / ***REM**OVE
      ***ADD**(...)
        SYMBOLIC-**NAME** = ***SAME** / <alphanum-name 1..8>
        ,**TYPE** = ***LOCAL** / ***REMOTE**
        ,**OPER**ATING-**MODE** = ***MANUAL** / ***ROBAR-1** / ***ROBAR-2** / ***EXT**ERNAL
,**OVERRULE-LOCATION** = ***UNCH**ANGED / ***Y**ES / ***REJECT**
,**VOL**UME-**ACCESS-CHECKS** = ***UNCH**ANGED / ***PAR**AMETERS(...)
  ***PAR**AMETERS(...)
    INPUT-TAPE-CHECK = ***UNCH**ANGED / ***Y**ES / ***NO**
    ,**INPUT-FI**LE-**CHECK** = ***UNCH**ANGED / ***Y**ES / ***NO**
    ,**TSOS-PRIV**ILEGED = ***UNCH**ANGED / ***Y**ES / ***NO**
    ,**PRIV**ILEGED-**USER-ID** = ***UNCH**ANGED / ***NONE** / <name 1..8>
    ,**RETPD-CHECK** = ***UNCH**ANGED / ***Y**ES / ***NO**
    ,**FOREIGN-TAPE-CHECK** = ***UNCH**ANGED / ***Y**ES / ***NO**
    ,**DEV**ICE-**COMPL**ETION = ***UNCH**ANGED / ***Y**ES / ***NO**
    ,**AUDIT** = ***UNCH**ANGED / ***Y**ES / ***N**O **/ *OPT**IONAL
    ,**TEST-MODE** = ***UNCH**ANGED / ***Y**ES / ***N**O

(part 1 of 3)

,**LOGGING** = ***UNCH**ANGED / ***Y**ES / ***N**O

,**CID-UID** = ***UNCH**ANGED / ***Y**ES / ***N**O

,**MOUNT-CHECK-INTERVAL** = ***UNCH**ANGED / <integer 9..9999 *seconds*>

,**RESERVATION-SEQUENCE** = ***UNCH**ANGED / ***BY-VSN** / ***BY-RESERVATION-COUNT** /
***BY-LAST-ACCESS-DATE** / ***BY-FREE-DATE**

,**OPERATOR-ROLE** = ***UNCH**ANGED / <name 1..8>

,**MAR**EN-**DEF**AULTS = ***UNCH**ANGED / ***PAR**AMETERS(...)

***PAR**AMETERS(...)
DEFAULT-**FREE-DATE** = ***UNCH**ANGED / <integer 0..9999>
,**DEF**AULT-**HOME-LOC** = ***UNCH**ANGED / ***HOST** / <alphanum-name 1..8>
,**DEF**AULT-**DEV**ICE-**TYPE** = ***UNCH**ANGED / <alphanum-name 1..8>
,**DEF**AULT-**USER-ACC**ESS = ***UNCH**ANGED / ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY /
***ALL-USERS**

,**RES**ERVE-**DEV**ICE-**TYPES** = ***UNCH**ANGED / ***PAR**AMETERS(...)

***PAR**AMETERS(...)
DEVICE-**TYPE** = <structured-name 1..8>
,**ACTION** = ***ADD** / ***REM**OVE

,**EXP**ORT-**RESTR**ICTIONS = ***UNCH**ANGED / ***PAR**AMETERS(...)

***PAR**AMETERS(...)
EXPORT-PROCESSING = ***UNCH**ANGED / ***Y**ES / ***NO**
,**EXPORT-FOREIGN-TAPES** = ***UNCH**ANGED / ***Y**ES / ***NO**
,**EXPORT-ADDR**ESS-**ACK** = ***UNCH**ANGED / ***Y**ES / ***NO**

,**ARCHIVES-WORK-TIME** = ***UNCH**ANGED / ***PAR**AMETERS(...)

***PAR**AMETERS(...)
OPEN-TIME = <time>
,**CL**OSE-**TIME** = <time>

,**EXP**ORT-**RECEIPT** = ***UNCH**ANGED / ***CONSOLE** / ***PRINTER**(...) / ***FI**LE / ***NO**

***PRINTER**(...)
DEVICE-**NAME** = ***ANY-LOCAL-PRINTER** / <name 1..8>
,**FORM-NAME** = ***STD** / <alphanum-name 1..6>

,**LI**FE-**TIME-LIMITS** = ***UNCH**ANGED / ***PAR**AMETERS(...)

***PAR**AMETERS(...)
BATCH-REQUEST-TIME = ***UNCH**ANGED / <integer 0..32767 *seconds*>
,**BATCH-EXEC-TIME** = ***UNCH**ANGED / <integer 0..32767 *seconds*>
,**DIALOG-REQUEST-TIME** = ***UNCH**ANGED / <integer 3..32767 *seconds*>
,**DIALOG-EXEC-TIME** = ***UNCH**ANGED / <integer 3..32767 *seconds*>

(part 2 of 3)

```
,MAREN-PASSWORD = *UNCHANGED / *NONE / <c-string 1..4> / <x-string 1..8> /
                  <integer -2147483648..2147483647> / *SECRET
,FREE-POOLS = *UNCHANGED / *PARAMETERS(...)
    *PARAMETERS(...)
        FREE-POOL = *NO / *GLOBAL / *TSOS / <filename 1..54 without-gen-vers> /
                    <text 2..32 without-sep>
        ACTION =*ADD / *REMOVE
,SHOW-INFORMATION = *UNCHANGED / *NORMAL / *MAXIMUM / *V8.1-AND-LOWER [1]
,HOST = *OWN / *ALL / <alphanum-name 1..8> / *ALL-FROM-DOMAIN (...)
    *ALL-FROM-DOMAIN (...)
        DOMAIN = *STD-DOMAIN / *OWN / <alphanum-name 1..8>
,ALL-DOMAIN-ADMIN = *UNCHANGED / *ALLOWED(...) / *NOT-ALLOWED(...)
    *ALLOWED(...)
        DEFAULT-ADMIN-SCOPE = *UNCHANGED / *OWN-DOMAIN / *ALL-DOMAIN
    *NOT-ALLOWED(...)
        DEFAULT-ADMIN-SCOPE = *OWN-DOMAIN
```

(part 3 of 3)

[1] The Operand value `*V8.1-AND-LOWER` is obsolete. It can still be specified for compatibility reasons.

Operands

LOCATION-ENTRIES = *UNCHANGED / *PARAMETERS(...)
In MAREN a location table is kept in which all locations are entered. Any changes to the location table are entered in the MAREN catalog.

LOCATION-NAME = <alphanum-name 1..8>
Location name. For a processing location, the system name must be specified.

ACTION = *ADD(...) / *REMOVE
Specifies whether the specified location name is to be added or deleted.

ACTION = *ADD(...)
Specifies whether the location is to be added. A maximum of 24 locations may be defined.

SYMBOLIC-NAME = *SAME / <alphanum-name 1..8>
Symbolic location name. Each location name can be assigned a symbolic location name to make addressing easier.

SYMBOLIC-NAME = *SAME
Declares that the name specified for the LOCATION-NAME parameter is to be used.

TYPE =
This location identifier refers to the physical distance between the location and the data center.

TYPE = *LOCAL
Specifies that the location is in the area of the local data center. This means that the tapes from this location can be directly requested for processing purposes.

TYPE = *REMOTE
Specifies that the location is not in the area of a remote data center. This means that any request to process tapes located there is rejected by MAREN because the volume is not available locally.

OPERATING-MODE =
Operating mode from which MAREN recognizes the location to which the jobs are to be sent.

OPERATING-MODE = *MANUAL
Location to be operated manually.

OPERATING-MODE = *ROBAR-1
Operating mode for real archive systems which are controlled via ROBAR.

OPERATING-MODE = *ROBAR-2
Operating mode for the archive system ETERNUS CS which is controlled via ROBAR.

OPERATING-MODE = *EXTERNAL
Operating mode for the location of a group of tapes and tape devices. The group is, for example, at a separate location which is to be operated manually in a remote building. The tapes in this archive should be processed only on the tape devices located there and not be mixed with tapes from other locations.

OVERRULE-LOCATION = *UNCHANGED / *YES / *REJECT
Specifies whether a location specified by the user is preferably used when a reservation file is employed.

OVERRULE-LOCATION = *REJECT
The location specified by the user is employed (differing locations lead to the reservation being rejected).

OVERRULE-LOCATION = *YES
The location specified in the reservation file is used.

VOLUME-ACCESS-CHECKS = *UNCHANGED / *PARAMETERS(...)
Specifies which of the various tape checks are to be performed by MAREN.

INPUT-TAPE-CHECK = *UNCHANGED / *YES / *NO
Specifies whether all tape checks are also to be performed in the case of input tapes (see the AUDIT operand on page 306).

INPUT-FILE-CHECK = *UNCHANGED / *YES / *NO
Specifies whether the file name is to be checked in the case of input tapes (see also operand AUDIT on page 306).

TSOS-PRIVILEGED = *UNCHANGED / *YES / *NO
Specifies whether the user ID TSOS is to be excluded from the tape checks.

PRIVILEGED-USER-ID = *UNCHANGED / *NONE / <name 1..8>
User ID to be excluded from the tape checks.

RETPD-CHECK = *UNCHANGED / *YES / *NO
Specifies whether the file expiration date (catalog entry field EXPIRATION-DATE) is to be checked for output tapes (see also operand AUDIT on page 306).

FOREIGN-TAPE-CHECK = *UNCHANGED / *YES / *NO
Specifies whether all foreign tapes are to be entered in the MAREN catalog before processing.

FOREIGN-TAPE-CHECK = *YES
All tapes must be entered in the MAREN catalog prior to processing. Otherwise, any attempt to access a tape will be rejected with an error message.

FOREIGN-TAPE-CHECK = *NO
When accessing foreign tapes not included in the MAREN catalog, the tape checks are not performed and no messages are issued.

DEVICE-COMPLETION = *UNCHANGED / *YES / *NO
Automatic completion of the specifications in the IMPORT-FILE command or FILE macro.

DEVICE-COMPLETION = *YES
For file assignments with the operand VOLUME=vsn but without a DEVICE entry, the device type (if any) from the MAREN catalog entry is included in the parameter list of the corresponding DMS command or macro.

DEVICE-COMPLETION = *NO
The parameter list is not modified.

AUDIT = *UNCHANGED / *YES / *NO / *OPTIONAL
Specifies whether accesses to these tapes are to be monitored by MAREN and, if necessary, aborted.

AUDIT = *YES
Accesses are monitored. The AUDIT flag in the tapes' catalog entries is not evaluated. In the event of an error the basic action is aborted. Individual tape checks can, however, be disabled using the FOREIGN-TAPE-CHECK, INPUT-TAPE-CHECK, INPUT-FILE-CHECK and RETPD-CHECK operands. Specific user IDs can also be excluded from monitoring.

AUDIT = *NO
Accesses are not monitored. The AUDIT flag in the tapes' catalog entries is not evaluated. Individual tape checks which were enabled using the FOREIGN-TAPE-CHECK, INPUT-TAPE-CHECK, INPUT-FILE-CHECK and RETPD-CHECK operands are performed, but in the event of an error they do not lead to an abortion.

AUDIT = *OPTIONAL
Accesses are monitored, and errors which are detected are reported. However, the action involved is only aborted if the AUDIT flag is set in the catalog entry of the tape concerned or no catalog entry exists. Individual tape checks can, however, be disabled using the FOREIGN-TAPE-CHECK, INPUT-TAPE-CHECK, INPUT-FILE-CHECK and RETPD-CHECK operands. Specific user IDs can also be excluded from monitoring.

TEST-MODE = *UNCHANGED / *YES / *NO
Enables or disables test mode.

CAUTION!
When test mode is enabled, only tasks with the job name MARENTST are recorded by MAREN. For all other tasks, both all tape checks and the updating of the MAREN catalog are suppressed. The usual protection mechanisms will not be applied. Inconsistencies between backup archives and file catalogs may happen.

LOGGING = *UNCHANGED / *YES / *NO
Defines whether a record is written into the logging file for each modification of an catalog entry.

CID-UID = *UNCHANGED / *YES / *NO
When tape output files are created, causes not only the job name, date and time, but also the catalog ID of the pubset and the user ID under which the file is created to be included in the catalog entry. This does not apply for ARCHIVE backup runs with directory because in these cases the directory name is stored in the catalog entry with the catalog and user IDs.

MOUNT-CHECK-INTERVAL = *UNCHANGED / <integer 9..9999 *seconds*>
Defines the interval, in seconds, at which MARENUCP periodically checks whether a tape has been mounted. The first interval begins with the request for the operator to mount a free tape. The default value set is 60.

Only when MARENUCP first starts is the value from the MARENUCP-ENTER file accepted (the default value applies if nothing is specified); subsequently the specification in the ENTER file is ignored.

RESERVATION-SEQUENCE = *UNCHANGED / *BY-VSN /
***BY-RESERVATION-COUNT / *BY-LAST-ACCESS-DATE / *BY-FREE-DATE**
Defines the criterion according to which MARENUCP selects free tapes. The default value set is *BY-VSN.

Only when MARENUCP first starts is the value from the MARENUCP-ENTER file accepted (the default value applies if nothing is specified); subsequently the specification in the ENTER file is ignored.

RESERVATION-SEQUENCE = *BY-VSN
The selection criterion is the sequence of the archive numbers, beginning with the lowest alphanumeric archive number.

RESERVATION-SEQUENCE = *BY-RESERVATION-COUNT
The selection criterion is the number of reservations, beginning with the lowest number.

RESERVATION-SEQUENCE = *BY-LAST-ACCESS-DATE
The selection criterion is the date of the most recent access, beginning with the earliest date.

RESERVATION-SEQUENCE = *BY-FREE-DATE
The selection criterion is the date of the most recent release, beginning with the earliest date.

OPERATOR-ROLE = *UNCHANGED / <name 1..8>
Operator role which is to be used for the execution of MARENUCP and for the INITIALIZE-VOLUMES statement. When MARENCP is first started, the operator role SYSMAREN is entered.

MAREN-DEFAULTS = *UNCHANGED / *PARAMETERS(...)
Specifies the MAREN default values which are to be modified.

DEFAULT-FREE-DATE = *UNCHANGED / <integer 0..9999>
Number of days. Specifies the reservation period for tapes if the user has not made an appropriate entry during reservation.

DEFAULT-HOME-LOC = *UNCHANGED / *HOST / <alphanum-name 1..8>
Location name. Specifies which name is to be used for the permanent location in statements with the parameter HOME-LOCATION=*STD.

DEFAULT-HOME-LOC = *HOST
The local system name is used on every system.

DEFAULT-DEVICE-TYPE = *UNCHANGED / <alphanum-name 1..8>
Defines the default device type.
The default device type declared is used as the default in nearly all statements. If no explicit specification is made for the DEVICE-TYPE operand in these statements, only tapes of the device type DEFAULT-DEVICE-TYPE are selected. An exception to this is the SHOW-VOLUME-ATTRIBUTES statement.

DEFAULT-USER-ACCESS =
Specifies whether foreign user IDs may access the tape.

DEFAULT-USER-ACCESS = *OWNER-ONLY
Access to the tape is possible only under the specified user ID.

DEFAULT-USER-ACCESS = *FOREIGN-READ-ONLY
Only read access to the tape is possible under a foreign user ID.

DEFAULT-USER-ACCESS = *ALL-USERS
Unrestricted access to the tape is possible under a foreign user ID.

RESERVE-DEVICE-TYPES = *UNCHANGED / *PARAMETERS(...)
MAREN keeps a table which must contain all volume types which are permissible for new reservations. Up to 20 entries can be defined.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

ACTION = *ADD / *REMOVE
Specifies whether the device type is to be added or deleted.

EXPORT-RESTRICTIONS = *UNCHANGED / *PARAMETERS(...)
Restrictions with respect to the MAREN statement EXPORT-VOLUME.

EXPORT-PROCESSING = *UNCHANGED / *YES / *NO
Specifies whether the MAREN statement EXPORT-VOLUME for exporting own tapes is to be permitted.

EXPORT-FOREIGN-TAPES = *UNCHANGED / *YES / *NO
Specifies whether the export of own tapes assigned to a foreign user ID with the attribute USER-ACCESS=ALL-USERS is to be permitted.

EXPORT-ADDRESS-ACK = *UNCHANGED / *YES / *NO
Specifies whether the defined mailing address should be acknowledged by the operator when exporting or returning tapes.

ARCHIVES-WORK-TIME = *UNCHANGED / *PARAMETERS(...)
Time the central archive is open. Tapes can only be exported or returned during the specified time period. Any specifications entered in seconds will be ignored.

OPEN-TIME = <time>
Opening time in the format `hh[:mm[:ss]]`, where initial zeros need not be entered for `hh`, `mm` and `ss`.

CLOSE-TIME = <time>
Closing time in the format `hh[:mm[:ss]]`, where initial zeros need not be entered for `hh`, `mm` and `ss`.

When the value “24:00” is specified in the CLOSE-TIME operand, CLOSE-TIME=00:00 is used. OPEN-TIME=00:00 and CLOSE-TIME=00:00 also mean that the archive is open all day.

EXPORT-RECEIPT = *UNCHANGED / *CONSOLE / *PRINTER(...) / *FILE / *NO
This operand controls the creation and printout of the export receipts of the EXPORT-VOLUME statement. The layout of the export receipt is described in section “Export receipt” on page 60.

EXPORT-RECEIPT = *CONSOLE
No export receipt is generated. The message `MARM162` appears on the console:

EXPORT-RECEIPT = *PRINTER(...)
Specifies that the export receipts are to be generated and printed immediately. For this purpose, the temporary file `MAREN.EXPORT-RECEIPT.<vsn>` is created under the user ID of the calling task. If this file already exists, it is extended with OPEN=EXTEND. The result is the same as a printout produced with the PRINT-DOCUMENT document in conjunction with DOCUMENT-FORMAT=*TEXT(LINE-SPACING=*BY-EBCDIC-CONTROL) and DELETE-AFTER-PRINT=*DESTROY.
This specification is also evaluated for the statements RETURN-VOLUMES and SECURE-FREE-VOLUMES with the operand MESSAGE-DEST=*PRINTER.

DEVICE-NAME =
Identifies the printer to be used for output.

DEVICE-NAME = *ANY-LOCAL-PRINTER
Output is to a local printer.

DEVICE-NAME = <name 1..8>
Output is to a RSO printer.

FORM-NAME =
Identifies the paper (form type) to be used for output.

FORM-NAME = *STD
A standard form is used.

FORM-NAME = <alphanum-name 1..6>
Name of the form to be used. This name must be defined in the SPOOL parameter file and can be queried by means of the SHOW-SPOOL-FORMS command. The SPOOL parameter file also defines whether a cover page is to be printed (see the “Spool & Print - Commands” manual [23]).

EXPORT-RECEIPT = *FILE
Specifies that the export receipt is only to be written to the file `MAREN.EXPORT-RECEIPT.<vsn>` under the user ID of the calling task and is not to be printed. If the file does not exist or is empty, it is created. If this file already exists, it is extended with OPEN=EXTEND. The file can be printed later using the PRINT-DOCUMENT command.

EXPORT-RECEIPT = *NO
Specifies that export receipt are not to be created.

LIFE-TIME-LIMITS = *UNCHANGED / *PARAMETERS(...)
Specifies how long the tasks are to remain in certain wait states.

BATCH-REQUEST-TIME = *UNCHANGED / <integer 0..32767 *seconds*>
Wait time in seconds. Specifies the maximum time a batch task is to wait for acceptance of a MAREN transaction (access to the MAREN catalog).

BATCH-EXEC-TIME = *UNCHANGED / <integer 0..32767 *seconds*>
Wait time in seconds. Specifies the maximum time a batch task is to wait for execution of a MAREN transaction.

DIALOG-REQUEST-TIME = *UNCHANGED / <integer 3..32767 *seconds*>
Wait time in seconds. Specifies the maximum time an interactive task is to wait for acceptance of a MAREN transaction.

DIALOG-EXEC-TIME = *UNCHANGED / <integer 3..32767 *seconds*>
Wait time in seconds. Specifies the maximum time an interactive task is to wait for execution of a MAREN transaction.

MAREN-PASSWORD = *UNCHANGED / *NONE / <c-string 1..4> / <x-string 1..8> / <integer -2147483648..2147483647> / *SECRET
Password for the MAREN administrator

PASSWORD = *NONE
No password is specified.

PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

FREE-POOLS = *UNCHANGED / *PARAMETERS(...)
Determines the free tape pool which is to be generated or deleted.

FREE-POOL =
Specifies which free tape pool is to be edited.

FREE-POOL = *NO
The *NO free tape pool is edited.

FREE-POOL = *GLOBAL
The *GLOBAL free tape pool is edited.

FREE-POOL = *TSOS
The *TSOS free tape pool is edited.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
The free tape pool of a directory is edited. If this directory is located under a other user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool. The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other.

The values *STD and *SAME may not be specified.

ACTION =
Specifies if the free tape pool specified is to be created or deleted.

ACTION = *ADD
The free tape pool will be created. Tapes can then be subsequently allocated to the free tape pool.

ACTION = *REMOVE
The free tape pool will be deleted. No more tapes may be allocated to the free tape pool.

SHOW-INFORMATION = *UNCHANGED / *NORMAL / *MAXIMUM
Specifies which format the output of the SHOW-VOLUME-ATTRIBUTES statement is to have when a single archive number is specified. The INFORMATION operand of the SHOW-VOLUME-ATTRIBUTES statement renders this setting ineffective.

SHOW-INFORMATION = *NORMAL
Output will take place in the format with the most important information.
Output is not guaranteed and may be changed again in future software versions.

SHOW-INFORMATION = *MAXIMUM
The output contains all information. Output is not guaranteed and may be changed again in future software versions.

HOST =
Defines the system(s) whose parameters are to be modified.

HOST = *OWN
The parameters of the user's own system are to be modified.

HOST = *ALL
When domains are used, the parameters are modified for all systems in the DA's own domain; for the ADA, the parameters are changed for all systems.

HOST = <alphanum-name 1..8>
The parameters of the user's own system are to be modified.

HOST = *ALL-FROM-DOMAIN (...)
The parameters of all systems in a domain are to be modified.

DOMAIN = *STD-DOMAIN / *OWN / <alphanum-name 1..8>
Specifies the domains for whose systems the parameters are modified.

ALL-DOMAIN-ADMIN = *UNCHANGED / *ALLOWED(...) / *NOT-ALLOWED
Defines whether the ADA may work on the systems specified in the HOST operand.

The specifications can also be made for ALL-DOMAIN-ADMIN and DEFAULT-ADMIN-SCOPE if no domains are being used. The setting becomes effective as soon as domains are used.

ALL-DOMAIN-ADMIN = *ALLOWED(...)
The ADA may work on the systems specified in the HOST operand.

DEFAULT-ADMIN-SCOPE = *UNCHANGED / *OWN-DOMAIN / *ALL-DOMAIN
Defines which administration scope is to be set on the specified systems when MARENADM is started. When MARENCP is started for the first time, DEFAULT-ADMIN-SCOPE=*OWN-DOMAIN is set.

DEFAULT-ADMIN-SCOPE = *OWN-DOMAIN
When MARENADM is started on the specified systems, the rights of the DA are set.

DEFAULT-ADMIN-SCOPE = *ALL-DOMAIN
When MARENADM is started on the specified systems, the rights of the ADA are set provided the ADA password was specified beforehand. If the ADA password was not specified beforehand, a warning is issued and MARENADM starts with the rights of the DA.

ALL-DOMAIN-ADMIN = *NOT-ALLOWED(...)
The ADA may not work on the hosts specified in the HOST operand.

DEFAULT-ADMIN-SCOPE = = *OWN-DOMAIN
When MARENADM is started on the specified systems, the rights of the DA are set.

Examples

```
//modify-maren-parameters loc-entries=*par(loc-name=archiv01)
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

The location archiv01 is added. It is located in the area of the local data center, and its symbolic name is likewise ARCHIV01.

```
//modify-maren-parameters
  loc-entries=*par(loc-name=da1700,action=*add(symb-name=dva17,type=*remote))
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

The location da1700 with the symbolic name dva17 is added. No immediate access is possible to the tapes stored there, since this location is not in the area of the local data center.

```
//modify-maren-parameters loc-entries=*par(loc-name=dva11,action=*rem)
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

The location dva11 is deleted.

```
//modify-maren-parameters maren-def=*par(def-free-date=200)
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

The default reservation period for reserving a tape has been changed to 200 days.

```
//modify-maren-parameters archives-work-time=*par(open-time=7:30,cl-time=20)
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

The opening time for the central archive is 7:30 to 20:00 hours. Within this time period, tapes can be exported or requested.

```
//modify-maren-parameters export-receipt=*printer(dev-name=rsostat1)
%  MARM170 STATEMENT '//MODIFY-MAREN-PARAMETERS' PROCESSED
```

Export receipts for tapes are to be printed on the RSO printer with the name rsostat1.

MODIFY-TAPE-SET-ATTRIBUTES
Modify attributes of all tapes in a tape set

Privilege ADA, DA, administrator without domains

A tape set consists of all the tapes which belong to a tape file, or more precisely, all those catalog entries which have the same FILE-NAME and FIRST-VOL values.

The default value *UNCHANGED in the corresponding operands signifies that the previous setting is still applicable.
The value *NONE signifies that the specified catalog entry fields can be deleted in the catalog entry.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

MODIFY-**TAPE-SET-ATTR**IBUTES Alias: **MDTSA**

SELECT = ***BY-ATTR**IBUTES (...)
***BY-ATTR**IBUTES(...)
FILE-**NAME** = <filename 1..41 without-cat-user>
,**VERSION** = ***LATEST** / <integer -9999..0> / ***ALL** / ***NOT-CREATED**
,**USER-ID**ENTIFICATION = ***ALL** / <name 1..8>
,**TYPE-OF-VOL**UMES = ***VALID**(...) / ***OBSOLETE** / ***ANY**
***VALID**(...)
CLOSE-CHECK = ***NO** / ***Y**ES
,**DOMAIN** = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>
,**PROTECTION** = ***UNCH**ANGED / ***PAR**AMETERS(...)
***PAR**AMETERS(...)
PASSWORD = ***UNCH**ANGED / ***NONE** / <c-string 1..4> / <x-string 1..8> /
<integer -2147483648..2147483647> / ***SECRET**
,**USER-ACCESS** = ***UNCH**ANGED / ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY / ***ALL-USERS**
,**FREE-DATE** = ***UNCH**ANGED / <date> / <integer 0..32767 *days*>
,**EXPIR**ATION-**DATE** = ***UNCH**ANGED / ***NONE** / <date> / <integer 0..32767 *days*>
,**AUDIT** = ***UNCH**ANGED / ***Y**ES / ***NO**
,**INIT**IALIZATION = ***UNCH**ANGED / ***Y**ES / ***NO** / ***ERASE**

(part 1 of 2)

```
,LOCATION = *UNCHANGED / *PARAMETERS(...)

  *PARAMETERS(...)
      HOME-LOCATION = *UNCHANGED / <alphanum-name 1..8>
     ,FREE-LOCATION = *UNCHANGED / <alphanum-name 1..8>
     ,TEMPORARY-LOCATION = *UNCHANGED / <alphanum-name 1..8>
,REMARK = *UNCHANGED / *NONE / <c-string 1..24>
,REMARK-2 = *UNCHANGED / *NONE / <c-string 1..10>
,REMARK-3 = *UNCHANGED / *NONE / <c-string 1..12>
,USER-FIELD = *UNCHANGED / *NONE / <c-string 1..54>
,ADMINISTRATOR-FIELD = *UNCHANGED / *NONE / <c-string 1..8 with-low>
,ADMINISTR-FIELD-2 = *UNCHANGED / *NONE / <c-string 1..16 with-low>
,EXPORT-ADDRESS = *UNCHANGED / *NONE / <c-string 1..50>
,EXPORT-DATE = *UNCHANGED / *NONE / <date>
```

(part 2 of 2)

Operands

SELECT = *BY-ATTRIBUTES(...)
Tape set to be selected for modification.

FILE-NAME = <filename 1..41 without-cat-user>
File name for which a tape set is to be selected.

VERSION =
This operand can be used to select a specific version (or status) of the specified file.

VERSION = *LATEST
Selects the latest version of the file (i.e. the last one created).

VERSION = <integer -9999..0>
Specifying 0 is equivalent to *LATEST, specifying -1 indicates the penultimate file status, etc.

VERSION = *ALL
Selects all the tapes which exist for the specified file name.

VERSION = *NOT-CREATED
Selects only those volumes which have been reserved with the specified file name but which have not been used (catalog entry fields CREATION-DATE and CREATION-TIME have not been set). The TYPE-OF-VOLUMES setting is of no consequence in this case and is therefore not interpreted.

USER-IDENTIFICATION =
This operand selects the user ID to which the tapes are assigned (archive entry field USER-ID).

USER-IDENTIFICATION = *ALL
The user IDs are not evaluated during selection.

USER-IDENTIFICATION = <name 1..8>
Only those archive numbers which are assigned to the specified user ID are selected.

TYPE-OF-VOLUMES =
This operand selects the volume sequences (catalog entry field VOLUME-SEQUENCE) within a tape set. These numbers are usually unique. Some numbers may be duplicated following a restart.

If VERSION=*NOT-CREATED is specified, the TYPE-OF-VOLUMES operand is ignored.

TYPE-OF-VOLUMES = *VALID(...)
If a volume sequence occurs more than once in a tape set, the one created most recently is selected.

CLOSE-CHECK =
This operand allows you to select whether the catalog entry fields CLOSE-INDICATOR should be evaluated.

CLOSE-CHECK = *NO
The CLOSE-INDICATOR catalog entry field is not evaluated.

CLOSE-CHECK = *YES
If the CLOSE-INDICATOR field is not set to CLOSED for one of the tapes in the tape set, the statement is aborted.

TYPE-OF-VOLUMES = *OBSOLETE
If tape sequence numbers occur more than once for a tape set, all are selected except the one most recently created.

TYPE-OF-VOLUMES = *ANY
The volume sequences for a tape set are not checked to establish whether they occur more than once.

DOMAIN =
Selects the domain in which the attributes for the tapes of a tape set are modified.

DOMAIN = *ANY
The attributes for the tapes of a tape set are modified in all domains.

DOMAIN = *OWN
The attributes for the tapes of a tape set in the user's own domain are modified.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
The attributes for the tapes of a tape set in the standard domain are modified.

DOMAIN = <alphanum-name 1..8>
The attributes for the tapes of a tape set in the specified domain are modified.

PROTECTION = *UNCHANGED / *PARAMETERS(...)
Tape protection attributes.

PASSWORD = *UNCHANGED / *NONE / <c-string 1..4> / <x-string 1..8> / <integer-2147483648..2147483647> / *SECRET Password protecting against unauthorized access to the tape. The password C'$$$$' is not permitted. The password is changed using this operand.

PASSWORD = *NONE
No password is specified.

PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

USER-ACCESS = *UNCHANGED / *OWNER-ONLY / *FOREIGN-READ-ONLY / *ALL-USERS
Specifies whether foreign user IDs may access the tape.

USER-ACCESS = *OWNER-ONLY
Access to the tape is possible only under the specified user ID.

USER-ACCESS = *FOREIGN-READ-ONLY
Only read access to the tape is possible under a foreign user ID.

USER-ACCESS = *ALL-USERS
Unrestricted access to the tape is possible under a foreign user ID.

FREE-DATE = *UNCHANGED / <date> / <integer 0..32767 *days*>
Expiration date of the tape. Up to this date, the tape remains reserved for the given user ID.

FREE-DATE = <date>
Date in the format `yyyy-mm-dd`. Dates earlier than the current date are rejected.

FREE-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN adds this number to the current date to generate the expiration date.

EXPIRATION-DATE = *UNCHANGED / *NONE / <date> / <integer 0..32767 *days*>
File expiration date.

EXPIRATION-DATE = <date>
Date in the format `yyyy-mm-dd`. Dates earlier than the current date are rejected.

EXPIRATION-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN adds this number to the current date to generate the expiration date.

AUDIT = *UNCHANGED / *YES / *NO
Specifies whether MAREN is to monitor and if necessary refuse access to this tape. The AUDIT flag is evaluated only if the system-specific MAREN parameter AUDIT is set to OPTIONAL.

AUDIT = *YES
Access to this tape is to be monitored.

AUDIT = *NO
No monitoring is to take place.

INITIALIZATION = *UNCHANGED / *YES / *NO / *ERASE
Specifies whether the tape is to be reinitialized and if required also erased once it reaches the tapes expiration date.

LOCATION = *UNCHANGED / *PARAMETERS(...)
Location characteristics.

HOME-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the location where the tape is normally to be stored.

FREE-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies location where the tape is to be relocated when it is transferred to the pool of free tapes after the reservation period has expired.

TEMPORARY-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the tape's current location.

REMARK = *UNCHANGED / *NONE / <c-string 1..24>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

REMARK-2 = *UNCHANGED / *NONE / <c-string 1..10>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

REMARK-3 = *UNCHANGED / *NONE / <c-string 1..12>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

USER-FIELD = *UNCHANGED / *NONE / <c-string 1..54>
Comment text. This catalog entry field may contain any user-specific data, e.g. name, department.

ADMINISTRATOR-FIELD = *UNCHANGED / *NONE / <c-string 1..8 with-low>
Comment text. Any internal information can be contained here. It cannot be read or changed by the MAREN user.

ADMINISTR-FIELD-2 = *UNCHANGED / *NONE / <c-string 1..16 with-low>
Comment text. Any internal information can be contained here. It cannot be read or changed by the MAREN user.

EXPORT-ADDRESS = *UNCHANGED / *NONE / <c-string 1..50>
Mailing address. Specifies the destination to which the tape is to be sent if mailed. If the tape is to be picked up personally, any text to this effect can be specified, e.g. “Mailbox G7”.

EXPORT-DATE = *UNCHANGED / *NONE / <date>
Export date in the format `yyyy-mm-dd`.

Notes

- It is not possible to change the storage location for tapes of a tape set assigned to a location with the operating mode ROBAR-2.
- When modifying tape attributes, the FSEQ-1 entry is also modified if entries with FSEQ > 1 are also part of the tape set. The following operands are affected:
  - INITIALIZATION
  - EXPIRATION-DATE
    This may modify FREE-DATE in the FSEQ-1 entry. The initialization flag would also be set when EXPIRATION-DATE is reduced.
  - FREE-DATE
    This is reduced only if the EXPIRATION-DATE operand of all catalog entries for this tape is less than or equal to the new FREE-DATE.

Examples

```
//modify-tape-set-attributes f-name=file.x,remark='release progx v1.0a'
```

The string specified for the REMARK operand is to be entered in the remark field for all tapes written to when the file `FILE.X` was last created. The remark is intended to describe the tape contents.

```
//modify-tape-set-attributes f-name=file.x,version=-1,
  type-of-vol=*obsolete,free-date=0
```

The second last time the specified file was created (VERSION=-1), the system crashed during tape output while writing to, say, the fifth tape. While the third tape was being written to, the user program set a restart point at which output can be resumed once the system has been restarted (using the RESTART-PROGRAM command).

The third tape from the aborted job is used again, while the remaining tapes, which have higher volume sequences (VOLUME-SEQUENCE), are automatically reassigned by the automatic free tape allocation facility. The tapes with volume sequences 4 and 5 which originated from the aborted job cannot be used. It should therefore be released (operand FREE-DATE=0).

MODIFY-VOLUME-ATTRIBUTES
Modify attributes of tapes in the MAREN catalog

Privilege ADA, DA, administrator without domains

The default value *UNCHANGED in a given operand signifies that the previous setting is applicable.
The value *NONE signifies that the specified catalog entry fields can be deleted in the catalog entry.

DAs can only execute the statement in their own domain. The DOMAIN and NEW-DOMAIN operands are thus meaningless for them.

Format

MODIFY-**VOL**UME-**ATTR**IBUTES Alias: **MD** / **MDVA**

VOLUME = ***NONE** / <vsn>(...) / ***INT**ERVAL(...) / ***BY-INP**UT-**FI**LE(...) / ***ALL**

<vsn>(...)
FILE-**SEQ**UENCE = **1** / <integer 1..9999>
,**FI**LE-**NAME** = ***UNCH**ANGED / ***NONE** / <filename 1..41 without-cat-user>
,**EXPIR**ATION-**DATE** = ***UNCH**ANGED / ***NONE** / <date> / <integer 0..32767 *days*>
,**VOL**UME-**SEQ**UENCE = ***UNCH**ANGED / <integer 1..255>
,**FIRST-VOL**UME = ***UNCH**ANGED / ***NONE** / <vsn>
,**ACCESS-COUNT** = ***UNCH**ANGED / <integer 0..99999999>
,**RES**ERVATION-**COUNT** = ***UNCH**ANGED / <integer 0..9999>
,**RES**ERVATION-**DATE** = ***UNCH**ANGED / ***NONE** / <date>
,**DEV**ICE-**NAME** = ***UNCH**ANGED / ***NONE** / <alphanum-name 2..4>
,**OPEN-MODE** = ***UNCH**ANGED / ***NONE** / ***INPUT** / ***OUTPUT** / ***EXTEND** / ***INOUT** / ***OUTIN** / ***SINOUT** / ***REVERSE**
,**CL**OSE-**INDICATOR** = ***UNCH**ANGED / ***NONE** / ***OPEN** / ***CL**OSE
,**LAST-CL**OSE-**DATE** = ***UNCH**ANGED / ***NONE** / <date>
,**LAST-CL**OSE-**TIME** = ***UNCH**ANGED / ***NONE** / <time>
,**CRE**ATION-**CATALOG-ID** = ***UNCH**ANGED / ***NONE** / <cat-id 1..4>
,**CRE**ATION-**USER-ID** = ***UNCH**ANGED / ***NONE** / <name 1..8>
,**CRE-JOB-OR-REQ-NAME** = ***UNCH**ANGED / ***NONE** / <name 1..8>
,**CRE**ATION-**DATE** = ***UNCH**ANGED / ***NONE** / <date>
,**CRE**ATION-**TIME** = ***UNCH**ANGED / ***NONE** / <time>
,**LAST-WRITE-BLK-CNT** = ***UNCH**ANGED / <integer_0..2147483647> / <text 10..10 without-sep>

(part 1 of 3)

,**SAVE-FI**LE-**ID** = ***UNCH**ANGED / ***NONE** / <composed-name_15..15> (...)
<composed-name 15..15> (...)
SUB-SAVE-NUMBER = <integer 0..15>
SUB-SEQUENCE-**NUMBER** = <integer 1..255>
,**LAST-ACCESS-STA**TUS = ***UNCH**ANGED / ***PAR**AMETERS(...)
***PAR**AMETERS(...)
LAST-ACCESS-USER-ID = ***UNCH**ANGED / ***NONE** / <name 1..8>
,**LAST-ACCESS-ACCOUNT** = ***UNCH**ANGED / ***NONE** / <alphanum-name 1..8>
,**LAST-ACCESS-JOB-NAME** = ***UNCH**ANGED / ***NONE** / <name 1..8>
,**LAST-ACCESS-TSN** = ***UNCH**ANGED / ***NONE** / <alphanum-name 1..4>
,**LAST-ACCESS-SNO** = ***UNCH**ANGED / ***NONE** / <integer 1..255>
,**LAST-ACCESS-DATE** = ***UNCH**ANGED / ***NONE** / <date>
,**LAST-ACCESS-TIME** = ***UNCH**ANGED / ***NONE** / <time>
,**LAST-ACCESS-HOSTNAME** = ***UNCH**ANGED / ***NONE** / <alphanum-name 1..8>

***INT**ERVAL(...)
FROM = ***FIRST** / <vsn>
,**TO** = ***LAST** / <vsn>
,**FROM-FSEQ** = **1** / <integer 1..9999>

***BY-INP**UT-**FI**LE(...)
FILE-**NAME** = <filename 1..54>

,**SELECT** = ***ALL**(...) / ***RES**ERVED(...) / ***FREE**(...)

***ALL**(...)
DOMAIN = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>
,NEW-DOMAIN = ***SAME** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

***RES**ERVED(...)
USER-IDENTIFICATION = ***ALL** / <name 1..8>
,DOMAIN = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>
,**DIR**ECTORY-**NAME** = ***ALL** / <filename 1..54 without-gen-vers> (...)
<filename 1..54 without-gen-vers> (...)
SAVE-FILE-**ID** = ***ALL / *LATEST** / <integer -32767..0> / <composed-name 15..15>
,**VOL**UME-**GR**OUP = ***ANY** / ***NONE** / <text 1..32 without-sep>
,**NEW-USER-ID** = ***SAME** / <name 1..8>
,NEW-DOMAIN = ***SAME** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>
,**NEW-DIR**ECTORY-**NAME** = ***SAME** / ***NONE** / <filename 1..54 without-gen-vers>
,**NEW-FREE-POOL** = ***SAME** / ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54> /
<text 2..32 without-sep>
,**NEW-VOL**UME-**GR**OUP = ***SAME** / ***NONE** / <text 1..32 without-sep>

(part 2 of 3)

```
    *FREE(...)
        FREE-POOL = *NO / *GLOBAL / *TSOS / <filename 1..54 without-gen-vers> /
                    text_2..32_without-separators>
        ,DEVICE-TYPE = *STD / *ANY / <structured-name 1..8>
        ,DOMAIN = *ANY / *OWN / *STD-DOMAIN / <alphanum-name 1..8>
        ,NEW-FREE-POOL = *SAME / *NO / *GLOBAL / *TSOS / <filename 1..54> /
                         <text 2..32 without-sep>
        ,NEW-DOMAIN = *SAME / *OWN / *STD-DOMAIN / <alphanum-name 1..8>
,ACCOUNT = *UNCHANGED / *NONE / <alphanum-name 1..8>
,PROTECTION = *UNCHANGED / *PARAMETERS(...)
    *PARAMETERS(...)
        PASSWORD = *UNCHANGED / *NONE / <c-string 1..4> / <x-string 1..8> /
                   <integer -2147483648..2147483647> / *SECRET
        ,USER-ACCESS = *UNCHANGED / *OWNER-ONLY / *FOREIGN-READ-ONLY / *ALL-USERS
        ,FREE-DATE = *UNCHANGED / <date> / <integer 0..32767 days>
        ,EXPIRATION-DATE= *UNCHANGED / *NONE / <date with-compl> / <integer 0..32767 days>
        ,AUDIT = *UNCHANGED / *YES / *NO
        ,INITIALIZATION = *UNCHANGED / *YES / *NO / *ERASE
,LOCATION = *UNCHANGED / *PARAMETERS(...)
    *PARAMETERS(...)
        HOME-LOCATION = *UNCHANGED / <alphanum-name 1..8>
        ,FREE-LOCATION = *UNCHANGED / <alphanum-name 1..8>
        ,TEMPORARY-LOCATION = *UNCHANGED / <alphanum-name 1..8>
,REMARK = *UNCHANGED / *NONE / <c-string 1..24>
,REMARK-2 = *UNCHANGED / *NONE / <c-string 1..10>
,REMARK-3= *UNCHANGED / *NONE / <c-string 1..12>
,USER-FIELD = *UNCHANGED / *NONE / <c-string 1..54>
,ADMINISTRATOR-FIELD = *UNCHANGED / *NONE / <c-string 1..8 with-low>
,ADMINISTR-FIELD-2 = *UNCHANGED / *NONE / <c-string 1..16 with-low>
,EXPORT-ADDRESS = *UNCHANGED / *NONE / <c-string 1..50>
,EXPORT-DATE = *UNCHANGED / *NONE / <date>
,OVERFLOW-CONTROL = *BY-PROGRAM / *BY-SYSTEM
,REGISTRATION-DATE = *UNCHANGED / *NONE / <date with-compl>
```

(part 3 of 3)

Operands

VOLUME =
Archive numbers of tapes whose catalog entries are to be modified.

VOLUME = <vsn>(...)
Archive number.

FILE-SEQUENCE = 1 / <integer 1..9999>
File sequence number whose catalog entry is to be modified.

FILE-NAME = *UNCHANGED / *NONE / <filename 1..41 without-cat-user>
Name of the file with the specified file sequence number located on the tape. If an directory name is entered in the catalog entry, NEW-DIR-NAME=*NONE or NEW-FREE-POOL=*NO must be specified before a file name can be entered.

EXPIRATION-DATE = *UNCHANGED / *NONE / <date> / <integer 0..32767 *days*>
File expiration date.

EXPIRATION-DATE = <date>
Date in the format `yyyy-mm-dd`. Dates earlier than the current date are rejected.

EXPIRATION-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN adds this number to the current date to generate the expiration date.

VOLUME-SEQUENCE = *UNCHANGED / <integer 1..255>
File section number within a multivolume file (MV set).

FIRST-VOLUME = *UNCHANGED / *NONE / <vsn>
First archive number of a multivolume file (file set ID).

ACCESS-COUNT = *UNCHANGED / <integer 0..99999999>
Number of (read and write) accesses to the tape.

RESERVATION-COUNT = *UNCHANGED / <integer 0..9999>
Specifies how often this tape has been reserved up to now.

RESERVATION-DATE = *UNCHANGED / *NONE / <date>
Specifies the last time this tape was reserved.

DEVICE-NAME = *UNCHANGED / *NONE / <alphanum-name 2..4>
Name (mnemonic) of the device on which the tape was last processed.

OPEN-MODE = *UNCHANGED / *NONE / *INPUT / *OUTPUT / *EXTEND / *INOUT / *OUTIN / *SINOUT / *REVERSE
Open mode of the last access to the tape.

CLOSE-INDICATOR = *UNCHANGED / *NONE / *OPEN / *CLOSE
Indicates the status of a tape output file.

CLOSE-INDICATOR = *OPEN
Indicates that the output file was opened but has not yet been closed.

CLOSE-INDICATOR = *CLOSE
Indicates that the output file has been properly closed.

LAST-CLOSE-DATE = *UNCHANGED / *NONE / <date>
Date in the format yyyy-mm-dd. Specifying the last day on which a file on this tape was closed.

LAST-CLOSE-TIME = *UNCHANGED / *NONE / <time>
Time in the format hh[:mm[:ss]], where initial zeros need not be entered for hh, mm and ss. Specifies the time of day a file on this tape was last closed.

CREATION-CATALOG-ID = *UNCHANGED / *NONE / <cat-id>
Catalog ID of the pubset on which the tape was last written to.
If an directory name is entered in the catalog entry, NEW-DIRECTORY-NAME=*NONE or NEW-FREE-POOL=*NO must be specified before a value for CREATION-CATALOG-ID can be entered.

CREATION-USER-ID = *UNCHANGED / *NONE / <name 1..8>
User ID under which the tape was last written to.
If an directory name is entered in the catalog entry, NEW-DIR-NAME=*NONE or NEW-FREE-POOL=*NO must be specified before a value for CREATION-USER-ID can be entered.

CRE-JOB-OR-REQ-NAME = *UNCHANGED / *NONE / <name 1..8>
Name of the last job which wrote to this tape.

CREATION-DATE = *UNCHANGED / *NONE / <date>
Date in the format yyyy-mm-dd. Specifies the day on which the tape was last written to.

CREATION-TIME = *UNCHANGED / *NONE / <time>
Time in the format hh[:mm[:ss]], where initial zeros need not be entered for hh, mm and ss. Specifies the time of day at which the tape was last written to.

LAST-WRITE-BLK-CNT = *UNCHANGED / <integer_0..2147483647> / <text 10..10 without-sep>
Number of blocks occupying this tape at FSEQ = 0001. At FSEQ = 0001, the counter contains all blocks up to the end of this file.

SAVE-FILE-ID = *UNCHANGED / *NONE / <composed-name 15..15> (...)
SAVE-FILE-ID of a save file from HSMS/ARCHIVE.

SAVE-FILE-ID = <composed-name 15..15> (...)
The SAVE-FILE-ID has the following format: S.yymmdd.hhmmss.

SUB-SAVE-NUMBER = <integer 0..15>
SUB-SAVE-NUMBER of the backup tape (or backup subtask) of the SAVE-FILE-ID named above. If the administrator assigned a SAVE-FILE-ID, a SUB-SAVE-NUMBER must also be specified.

SUB-SEQUENCE-NUMBER = <integer 1..255>
SUB-SEQUENCE-NUMBER for the SUB-SAVE-NUMBER and SAVE-FILE-ID specified above. If the administrator assigned a SAVE-FILE-ID, then a SUB-SEQUENCE-NUMBER must also be specified.

LAST-ACCESS-STATUS = *UNCHANGED / *PARAMETERS(...)
Parameters during the last access.

LAST-ACCESS-USER-ID = *UNCHANGED / *NONE / <name 1..8>
User ID during the last access.

LAST-ACCESS-ACCOUNT = *UNCHANGED / *NONE / <alphanum-name 1..8>
Account number during the last access.

LAST-ACCESS-JOB-NAME = *UNCHANGED / *NONE / <name 1..8>
Job name during the last access.

LAST-ACCESS-TSN = *UNCHANGED / *NONE
Task sequence number during the last access.

LAST-ACCESS-TSN = *NONE
Four blanks are entered. This enables the internal MAREN tape lock to be lifted.

LAST-ACCESS-SNO = *UNCHANGED / *NONE / <integer 1..255>
Session number during the last access.

LAST-ACCESS-DATE = *UNCHANGED / *NONE / <date>
Date of the last access in the format `yyyy-mm-dd`.

LAST-ACCESS-TIME = *UNCHANGED / *NONE / <time>
Time of the last access in the format `hh[:mm[:ss]]`, where initial zeros need not be entered for `hh`, `mm` and `ss`.

LAST-ACCESS-HOSTNAME = *UNCHANGED / *NONE / <alphanum-name 1..8>
System name during the last access.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the MAREN program interface.

VOLUME = *ALL
All tapes are processed.

VOLUME = *BY-INPUT-FILE(...)
Selects the catalog entries to be modified by means of an input file.

FILE-NAME = <filename 1..54>
Name of a SAM file which contains full catalog entries in MAREN format. Files created with editors can also be assigned.

From all the catalog entries in the input file, only the archive numbers (VOLUME) and file sequence numbers (FILE-SEQUENCE) contained in it are evaluated. The catalog entry for the specified tape is read from the MAREN catalog, and the catalog entry fields specified there in the statement are updated.

If there is no catalog entry in the MAREN for a tape contained in the input file, this fact is logged, task switch 31 is set, and processing continues with the next archive entry from the input file.

If a file is assigned which contains no complete catalog entries and which was created using an editor, the records it contains must have the following format:

Byte	Contents
1-4	Record length field
5-10	VSN, if necessary padded with trailing blanks, e.g. 'TAPE1 '
11-14	File sequence number, e.g. '0001'
15-510	Not set or any text

Further selection criteria (SELECT operand) are taken into account in accordance with the catalog entry. If, for example, SELECT=*FREE was specified and the tape is flagged in the MAREN catalog as reserved but as free in the input file, the MAREN catalog is not changed.

Only the catalog entries in the MAREN catalog are updated. The input file remains unchanged.

SELECT =
Specifies which catalog entries are to be selected.

SELECT = *ALL(...)
All catalog entries identified by the VOLUME operand are processed.

DOMAIN =
Selects the domain.

DOMAIN = *ANY
The tapes from all domains are processed.

DOMAIN = *OWN
The tapes from the user's own domain are processed.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
The tapes from the standard domain are processed.

DOMAIN = <alphanum-name 1..8>
The tapes from the specified domain are processed.

NEW-DOMAIN =
Assigns the domain.

NEW-DOMAIN = *SAME
The domain assignment remains unchanged.

NEW-DOMAIN = *OWN
The tapes are assigned to the user's own domain.
The user's own domain is the domain of the system on which the ADA is currently working.

NEW-DOMAIN = *STD-DOMAIN
The tapes are assigned to the standard domain.

NEW-DOMAIN = <alphanum-name 1..8>
The tapes are assigned to the specified domain.

SELECT = *RESERVED(...)
Only the catalog entries of reserved local and foreign tapes are processed.

USER-IDENTIFICATION = *ALL / <name 1..8>
User ID. All catalog entries assigned to the specified user ID are processed.

DOMAIN = *ANY / *OWN / *STD-DOMAIN / <alphanum-name 1..8>
Reserved tapes from a selected domain are processed.

DIRECTORY-NAME =
The reserved tapes assigned to the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

DIRECTORY-NAME = *ALL
No selection is made from the directory.

DIRECTORY-NAME = <filename 1..54 without-gen-vers> (...)
Only tapes which are allocated to the pool of the specified directory are selected. The selection may already have been restricted using the VOLUME operand.

SAVE-FILE-ID =
The tapes to be processed are selected using the save file of the directory named above.

SAVE-FILE-ID = *ALL
All tapes from this directory are to be processed.

SAVE-FILE-ID = *LATEST
All tapes listed in the last, i.e. most recent save file are selected.

SAVE-FILE-ID = <integer -32767..0>
All tapes listed in the nth save file are selected (the older the save file, the larger the number n). 0 equals *LATEST. Example: if -5 is specified, the tapes are selected from the last save file but five.

SAVE-FILE-ID = <composed-name 15..15>
All tapes in the save file with the specified SAVE-FILE-ID are selected. The SAVE-FILE-ID has the following format: `S.yymmdd.hhmmss`.

VOLUME-GROUP = *ANY / *NONE / <text 1..32 without-sep>
Specifies the volume group to which a tape must belong for it to be processed. When *ANY is specified, the volume group is irrelevant; when *NONE is specified, the tape may not belong to a volume group. “*” can be entered as the last character. In this case all volume groups which begin with the specified string are selected.

NEW-USER-ID = *SAME / <name 1..8>
User ID. This ID will be entered for all selected catalog entries.

NEW-USER-ID = *SAME
The user ID remains unchanged.

NEW-DOMAIN = *SAME / *OWN / *STD-DOMAIN / <alphanum-name 1..8>
Domain assignment. The tapes are reassigned to the specified domain.

NEW-DIRECTORY-NAME = *SAME / *NONE / <filename 1..54 without-gen-vers>
The new directory name for reserved tapes is specified here.
If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.
If the catalog entry fields FILE-NAME, CREATION-CATALOG-ID, or CREATION-USER-ID are set in the archive entry, these must be deleted with *NONE.

NEW-DIRECTORY-NAME = *SAME
The allocation to a directory is not modified.

NEW-DIRECTORY-NAME = *NONE
Any directory name present is deleted.

NEW-FREE-POOL =
Modifies the allocation to particular free tape pool.

NEW-FREE-POOL = *SAME
The allocation to a free tape pool remains unchanged.

NEW-FREE-POOL = *NO
The tapes are assigned to the *NO free tape pool.

NEW-FREE-POOL = *GLOBAL
The tapes are assigned to the free tape pool for general HSMS/ARCHIVE applications under any user ID.

NEW-FREE-POOL = *TSOS
The tapes are assigned to the free tape pool for HSMS/ARCHIVE applications under the user ID TSOS.

NEW-FREE-POOL = <filename 1..54 without-gen-vers>
The tapes are assigned to the free tape pool for ARCHIVE applications using the specified directory. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted. The directory name specified here must match that entered under DIRECTORY-NAME or NEW-DIRECTORY-NAME, or DIRECTORY-NAME must not be entered. Prior to modification, the contents of the catalog entry fields FILE-NAME, CREATION-CATALOG-ID and CREATION-USER-ID must be deleted with *NONE.

NEW-FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with "*" followed by at least one character from A-Z or 0-9. The characters ".", "-" and "_" are permitted, but not at the end and not next to each other. If the relevant free tape pool does not yet exist, it will be created.

The value *STD may not be specified.

NEW-VOLUME-GROUP = *SAME / *NONE / <text 1..32 without-sep>
Defines the new volume group to which a selected tape is assigned. When *SAME is specified, the volume group remains unchanged; when *NONE is specified, the affiliation to a volume group is deleted.

SELECT = *FREE(...)
Only the catalog entries from free tapes are processed.

FREE-POOL =
Selects the catalog entries of free tapes to be modified on the basis of the free tape pool.

FREE-POOL = *NO
Only tapes assigned to the *NO free tape pool are selected.

FREE-POOL = *GLOBAL
Only free tapes assigned to the free tape pool for general HSMS/ARCHIVE applications under any user ID are selected.

FREE-POOL = *TSOS
Only free tapes assigned to the free tape pool for HSMS/ARCHIVE applications under the user ID TSOS are selected.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
Only free tapes assigned to the free tape pool of the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
Only tapes of the default device type (DEFAULT-DEVICE-TYPE) specified in the control program's start procedure are selected.

DEVICE-TYPE = *ANY
All tapes are selected.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

DOMAIN =
Selects the domain.

DOMAIN = *ANY
The free tapes from all domains are processed.

DOMAIN = *OWN
The tapes of the user’s own domain are processed.
The user’s own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
The tapes of the standard domain are processed.

DOMAIN = <alphanum-name 1..8>
The tapes of the specified domain are processed.

NEW-FREE-POOL =
Modifies the allocation of free tapes to particular free tape pool.

NEW-FREE-POOL = *SAME
The allocation to a free tape pool remains unchanged.

NEW-FREE-POOL = *NO
The tapes are assigned to the *NO free tape pool.

NEW-FREE-POOL = *GLOBAL
The tapes are assigned to the free tape pool for general HSMS/ARCHIVE applications under any user ID.

NEW-FREE-POOL = *TSOS
The tapes are assigned to the free tape pool for HSMS/ARCHIVE applications under the user ID TSOS.

NEW-FREE-POOL = <filename 1..54 without-gen-vers>
The tapes are assigned to the free tape pool for HSMS/ARCHIVE applications using the specified directory. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

NEW-FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with "*" followed by at least one character from A-Z or 0-9. The characters ".", "-" and "_" are permitted, but not at the end and not next to each other. If the relevant free tape pool does not yet exist, it will be created.

NEW-DOMAIN =
Assigns the domain.

NEW-DOMAIN = *SAME
The domain assignment remains unchanged.

NEW-DOMAIN = *OWN
The tapes are assigned to the user's own domain.
The user's own domain is the domain of the system on which the ADA is currently working.

NEW-DOMAIN = *STD-DOMAIN
The tapes are assigned to the standard domain.

NEW-DOMAIN = <alphanum-name 1..8>
The tapes are assigned to the specified domain.

ACCOUNT = *UNCHANGED / *NONE / <alphanum-name 1..8>
Account number of the user ID entered in the catalog entry.

PROTECTION = *UNCHANGED/ *PARAMETERS(...)
Tape protection attributes.

PASSWORD = *UNCHANGED / *NONE / <c-string 1..4> / <x-string 1..8> / <integer -2147483648..2147483647> / *SECRET
Password protecting tapes against unauthorized access. The password C'$$$$' is not permitted. The password is changed using this operand.

PASSWORD = *NONE
No password is specified.

PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

USER-ACCESS =
Specifies whether foreign user IDs may access the tape.

USER-ACCESS = *OWNER-ONLY
Access to the tape is possible only under the specified user ID.

USER-ACCESS = *FOREIGN-READ-ONLY
Only read access to the tape is possible under a foreign user ID.

USER-ACCESS = *ALL-USERS
Unrestricted access to the tape is possible under a foreign user ID.

FREE-DATE = *UNCHANGED / <date> / <integer 0..32767 *days*>
Expiration date of the tape. Up to this date, the tape remains reserved for the specified user ID.

FREE-DATE = <date>
Date in the format `yyyy-mm-dd`. Dates earlier than the current date are rejected.

FREE-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN adds this number to the current date to generate the expiration date.

EXPIRATION-DATE =
Expiration date for all files on the tape.

EXPIRATION-DATE = *UNCHANGED
The expiration date is not updated.

EXPIRATION-DATE = *NONE
The expiration date is deleted for all selected files.

EXPIRATION-DATE = <date with-compl>
Date in the format `yyyy-mm-dd`. Dates earlier than the current date are rejected.

EXPIRATION-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN adds this number to the current date to generate the expiration date.

AUDIT = *UNCHANGED / *YES / *NO
Specifies whether MAREN is to monitor and if necessary refuse access to this tape. However, the AUDIT flag is evaluated only if the system-specific MAREN parameter AUDIT is set to OPTIONAL.

AUDIT = *YES
Access to this tape is to be monitored.

AUDIT = *NO
No monitoring is to take place.

INITIALIZATION = *UNCHANGED / *YES / *NO / *ERASE
Specifies whether the tape is to be reinitialized and if required also erased once it reaches its expiration date.

LOCATION = *UNCHANGED / *PARAMETERS(...)
Location characteristics.

HOME-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the location where the tape is normally to be stored.

FREE-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies location where the tape is to be relocated when it is transferred to the pool of free tapes after the reservation period has been reached.

TEMPORARY-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the tape's current location.

The locations of the logical tapes (operating mode ROBAR-2 for ETERNUS CS) can be modified. In this case HOME-LOCATION, FREE-LOCATION and TEMPORARY-LOCATION must be identical.

REMARK = *UNCHANGED / *NONE / <c-string 1..24>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

REMARK-2 = *UNCHANGED / *NONE / <c-string 1..10>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

REMARK-3 = *UNCHANGED / *NONE / <c-string 1..12>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

USER-FIELD = *UNCHANGED / *NONE / <c-string 1..54>
Comment text. This catalog entry field may contain any user-specific data, e.g. name, department.

ADMINISTRATOR-FIELD = *UNCHANGED / *NONE / <c-string 1..8 with-low>
Comment text. This field may contain any information. This catalog entry field cannot be read or changed by the user.

ADMINISTR-FIELD-2 = *UNCHANGED / *NONE / <c-string 1..16 with-low>
Comment text. This field may contain any information. It cannot be read or changed by the MAREN user.

EXPORT-ADDRESS = *UNCHANGED / *NONE / <c-string 1..50>
Mailing address. Specifies the destination to which the tape is to be sent if mailed. If the tape is to be picked up personally, any text to this effect can be specified, e.g. “Mailbox G7” .

EXPORT-DATE = *UNCHANGED / *NONE / <date>
Export date in the format `yyyy-mm-dd`.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000. Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

REGISTRATION-DATE = *UNCHANGED / *NONE / <date with-compl>
Date, in the format `yyyy-mm-dd`, on which the tape was entered in the MAREN catalog.

Notes

- In the MAREN catalog entry, the three catalog entry fields FILE-NAME, CREATION-CATALOG-ID and CREATION-USER-ID occupy the same area in which the name of a directory can also be stored.
  Consequently, when entering a directory name (NEW-DIRECTORY-NAME or NEW-FREE-POOL=<filename>), these three catalog entry fields must be empty or explicitly deleted. This is achieved by setting them to *NONE.
  Conversely, any existing directory name must likewise be deleted (NEW-DIRECTORY-NAME=*NONE) if, for example, a file name is to be added to the MAREN catalog entry by means of FILE-NAME=<filename>.
- A volume expiration date which precedes the expiration date of the first tape of an MF/MV set must not be set for the subsequent tapes in the set. The expiration date for the first tape (VOLUME-SEQUENCE = 1) must be reset if all the tapes in an MF/MV set are to be released.
- The operands DIRECTORY-NAME and NEW-DIRECTORY-NAME can only be used in connection with reserved tapes. The FREE-POOL operand can only be used in connection with free tapes. Thus, if a specific DIRECTORY-NAME is employed in a selection criterion in a SELECT operand, only the catalog entries for reserved tapes are modified. However, if a special free tape pool is specified (FREE-POOL operand), only the catalog entries for free tapes are modified.
- If you increment the file expiration date EXPIRATION-DATE, the expiration date FREE-DATE will also be incremented.
- If you decrement the file expiration date EXPIRATION-DATE, the INITIALIZATION catalog entry field is set to YES.
- Modification of the expiration date FREE-DATE is ignored for foreign tapes.
- If the value of the FREE-DATE operand is less than that of the EXPIRATION-DATE operand in the catalog entry, then the catalog entry is not modified. Instead, the spin off mechanism is triggered and an appropriate message is output. Decrementing FREE-DATE causes no problems provided EXPIRATION-DATE is decremented at the same time, e.g.:
  ```
  //MODIFY-VOLUME-ATTRIBUTES VOLUME=TAPE01,FREE-DATE=0,EXPIR-DATE=0
  ```
- It is not possible to change the storage location for tapes assigned to a location with the operating mode ROBAR-2.
- Tapes in ARCHIVE directories are not released despite their expiration date being reached. They must first be removed from the directory by means of the ARCHIVE statement POOL or PURGE. If this is not possible because the directory has been deleted in the meantime, the internal MAREN allocation to a directory can subsequently be canceled using the parameter DIRECTORY-NAME= *NONE.

- The internal tape lock (MAREN lock) can only be lifted in interactive mode using the statement `MODIFY-VOLUME-ATTRIBUTES VOLUME=<vsn>,LAST-ACCESS-TSN=*NONE` without any further operand. If the lock has actually been set for a TSN which still exists, the message `MARM157` appears.
- Related tapes can be combined to form a volume group. All files which are located on a tape automatically belong to this volume group. When a reserved tape which is assigned to a volume group is released, the assignment to the volume group is canceled for this tape.

Examples

```
//modify-volume-attr vol=*int(mb2240,mb2249),location=*par(home-loc=robabba1)
%  MARM121 MAREN CATALOG ENTRY 'MB2240'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2241'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2242'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2243'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2244'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2246'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2247'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2248'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2249'/'0001' MODIFIED
%  MARM120 TOTAL OF 9 MAREN CATALOG ENTRIES PROCESSED
```

This statement is used to assign the permanent location robabba1 for the tapes whose archive numbers lie within the range mb2240 to mb2249.

```
//modify-volume-attr vol=*all,select=*res(user-id=test1,new-user-id=test2)
%  MARM121 MAREN CATALOG ENTRY 'ID1040'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID1043'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID2004'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'MB2243'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'XY0005'/'0001' MODIFIED
%  MARM120 TOTAL OF 4 MAREN CATALOG ENTRIES PROCESSED
```

This statement assigns all tapes previously archived under the user ID TEST1 to the new user ID TEST2.

```
//mod-vol-attr vol=*int(id5000,id6000),sel=*reserved(user-id=user1),
   prot=*par(free-date=0)
%  MARM121 MAREN CATALOG ENTRY 'ID5001'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5002'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5003'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5004'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5005'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5006'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5007'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5801'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5802'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5803'/'0001' MODIFIED
%  MARM120 TOTAL OF 10 MAREN CATALOG ENTRIES PROCESSED
```

The expiration date of all tapes whose archive numbers lie within the range id5000 to id6000 and are assigned to the user ID user1 is set to the current date. As a consequence, the specified tapes are released in the course of the next release run using the MARENADM statement FREE-VOLUMES. Tapes whose archive numbers lie outside the specified number range or are not cataloged under the user ID USER1 are not affected.

```
//print-vol-attr voL=*int(id5000,id6000),sel=*y(loc01),
   output=list.vol.1,layout-contr=*no
%  JMS0066 JOB 'ULF' ACCEPTED ON <date> AT 08:59, TSN = 1AV5
%  MARM170 STATEMENT '//PRINT-VOLUME-ATTRIBUTES' PROCESSED
```

The location da1100 is to be replaced with da1200 in all catalog entries. For this purpose, the SELECT operand in the PRINT-VOLUME-ATTRIBUTES statement must indicate that all catalog entries containing the value da1100 in their HOME-, FREE- or TEMPORARY-LOCATION catalog entry field are to be included in the output file list.vol.1. This can be defined using the parameter set loc01.

The output file assigned in PRINT-VOLUME-ATTRIBUTES then serves as the input file for the MODIFY-VOLUME-ATTRIBUTES statement:

```
//mod-vol-attr vol=*by-input-file(f-name=list.vol.1),
   home-loc=da1200,free-loc=da1200,temp-loc=da1200
%  MARM121 MAREN CATALOG ENTRY 'ID5001'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5002'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5003'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5004'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5005'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5006'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5007'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5801'/'0001' MODIFIED
%  MARM121 MAREN CATALOG ENTRY 'ID5802'/'0001' MODIFIED
%  MARM120 TOTAL OF 9 MAREN CATALOG ENTRIES PROCESSED
```

OPEN-MAREN-FILES
Unlock and open the MAREN catalog

Privilege ADA, DA, administrator without domains

With this statement the files of the MAREN catalog (volume catalog and possibly the logging file) are opened again, and the catalog lock is reset. The administrator uses the HOST-NAME operand to specify whether the unlocking of the MAREN catalog is to apply for his/her own system, for a particular system, or for all systems in a MAREN network.

Format

OPEN-MAREN-**FI**LES Alias: **OPMF**

HOST-NAME = ***OWN** / ***ALL** / <alphanum-name 1..8> / ***ALL-FROM-DOMAIN**(...)

***ALL-FROM-DOMAIN**(...)
DOMAIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

Operands

HOST-NAME =
Specifies the systems for which the files of the MAREN catalog are to be opened.

HOST-NAME = *OWN
The files of the MAREN catalog are only opened for the local system.
If the ADA has used the MODIFY-ADMINISTRATION-SCOPE DOMAIN=... statement to become the DA of a domain, HOST=*OWN addresses the system which was determined by the HOST operand in the MODIFY-ADMINISTRATION-SCOPE statement.

HOST-NAME = *ALL
When domains are used, the files of the MAREN catalog are opened for all systems in a DA's own domain; for the ADA, the files of the MAREN catalog are opened for all systems.

HOST-NAME = <alphanum-name 1..8>
Name of a system.
If the DA enters a system name when domains are being used, this system must belong to the DA's own domain.

HOST-NAME = *ALL-FROM-DOMAIN (...)
The files of the MAREN catalog are opened for systems of particular domains. This operand may only be used by the ADA.

DOMAIN =
Selects the domain.

DOMAIN = *STD-DOMAIN
The files of the MAREN catalog are opened for the systems in the standard domain.

DOMAIN = *OWN
The files of the MAREN catalog are opened for the systems in the local domain. The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
The files of the MAREN catalog are opened for the systems in the specified domain.

PRINT-VOLUME-ATTRIBUTES
Create lists with information from the MAREN catalog

Privilege ADA, DA, administrator without domains

The selection and sort criteria and also the specifications for print editing can be defined individually and saved. The information to be output is output to a file in MAREN format. The file can also be created in CSV format to permit spreadsheet processing. It can also be specified that an file should be output on a printer or sent by email after it has been created.

Information on catalog entries to SYSOUT or in S variables is provided by the SHOW-VOLUME-ATTRIBUTES statement, see page 425.

Format

PRINT-VOLUME**-ATTR**IBUTES Alias: **PR** / **PRVA**

VOLUME = ***ALL** / ***INT**ERVAL(...)

***INT**ERVAL(...)
- **FROM** = ***FIRST** / <vsn>
- ,**TO** = ***LAST** / <vsn>
- ,**FROM-FSEQ** = **1** / <integer 1..9999>

,**SELECT** = ***NO** / ***Y**ES(...)

***Y**ES(...)
- **PAR**AMETER**-SET** = **STD** / <name 1..15>
- ,**PAR**AMETER**-FI**LE = ***STD** / <filename 1..54>
- ,**UPD**ATE = ***NO** / ***PERM**ANENT / ***TEMP**ORARY

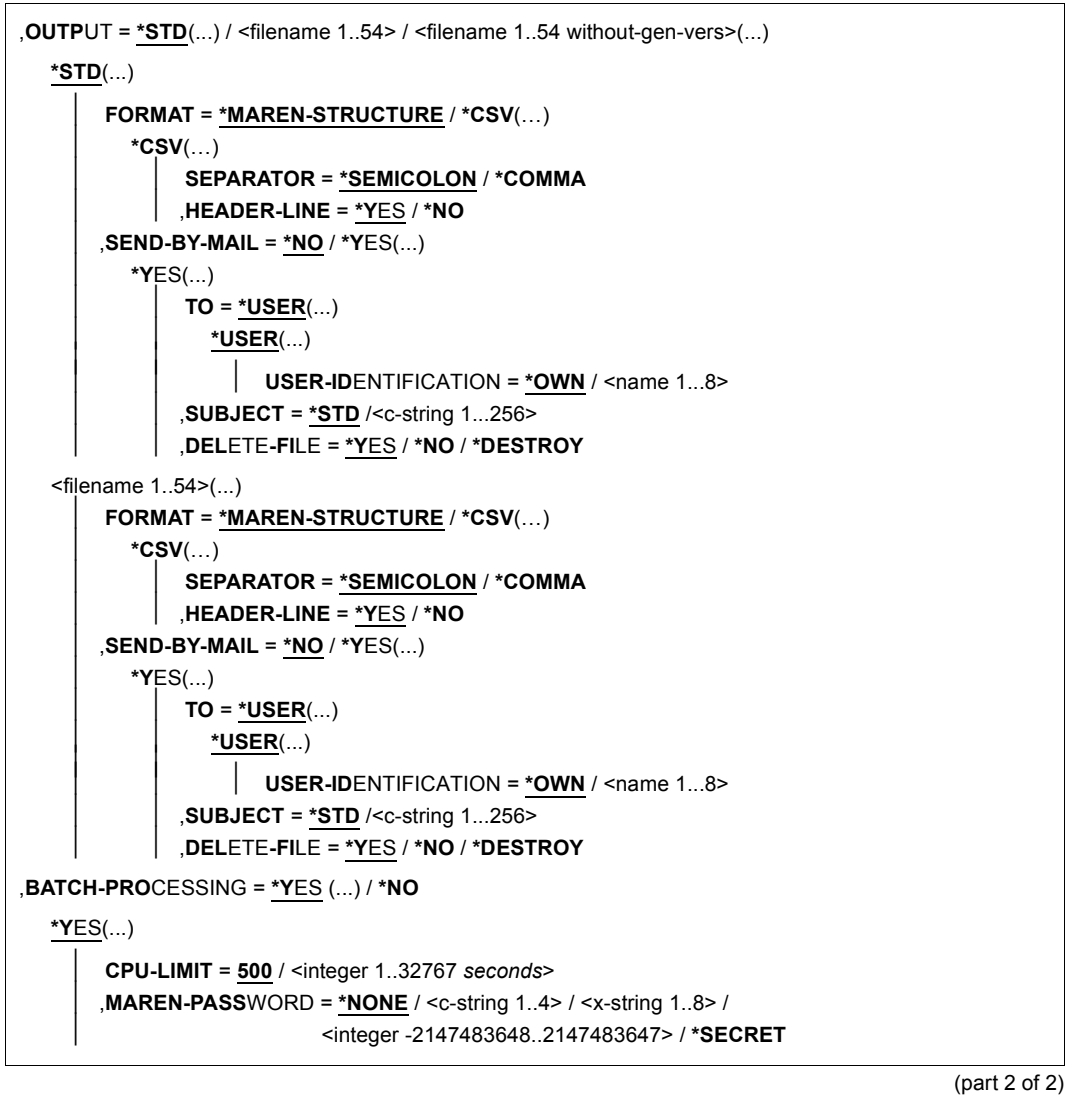
,**SORT** = ***NO** / ***Y**ES(...)

***Y**ES(...)
- **PAR**AMETER**-SET** = **STD** / <name 1..15>
- ,**PAR**AMETER**-FI**LE = ***STD** / <filename 1..54>
- ,**UPD**ATE = ***NO** / ***PERM**ANENT / ***TEMP**ORARY

,**LAYOUT-CONTR**OL = ***Y**ES (...) / ***NO**

***Y**ES(...)
- **PAR**AMETER**-SET** = **STD** / <name 1..15>
- ,**PAR**AMETER**-FI**LE = ***STD** / <filename 1..54>
- ,**UPD**ATE = ***NO** / ***PERM**ANENT(...) / ***TEMP**ORARY(...)
  - ***PERM**ANENT(...)
    - **UPD**ATE**-HEAD**ER = ***STD** / ***OLD**
  - ***TEMP**ORARY(...)
    - **UPD**ATE**-HEAD**ER = ***STD** / ***OLD**
- **,START-PRINT** = ***Y**ES (...) / ***NO**
  - ***Y**ES(...)
    - **SP**OOLOUT**-NAME** = ***NONE** / <alphanum-name 1..8>
    - ,**DEL**ETE**-FI**LE = ***Y**ES / ***NO** / ***DESTROY**
    - ,**TO-PR**INTER = ***STD** / ***PR**INTER**-NAME**(...) / ***PR**INTER**-POOL**(...)
      - ***PR**INTER**-NAME**(...)
        - **PR**INTER**-NAME** = <alphanum-name 1..8>
      - ***PR**INTER**-POOL**(...)
        - **PR**INTER**-POOL** = <alphanum-name 1..8>
    - ,**FORM-NAME** = ***STD** / <alphanum-name 1..8>

(part 1 of 2)


,OUTPUT = *STD(...) / <filename 1..54> / <filename 1..54 without-gen-vers>(...)
*STD(...)
FORMAT = *MAREN-STRUCTURE / *CSV(…)
*CSV(…)
SEPARATOR = *SEMICOLON / *COMMA
,HEADER-LINE = *YES / *NO
,SEND-BY-MAIL = *NO / *YES(...)
*YES(...)
TO = *USER(...)
*USER(...)
USER-IDENTIFICATION = *OWN / <name 1...8>
,SUBJECT = *STD /<c-string 1...256>
,DELETE-FILE = *YES / *NO / *DESTROY
<filename 1..54>(...)
FORMAT = *MAREN-STRUCTURE / *CSV(…)
*CSV(…)
SEPARATOR = *SEMICOLON / *COMMA
,HEADER-LINE = *YES / *NO
,SEND-BY-MAIL = *NO / *YES(...)
*YES(...)
TO = *USER(...)
*USER(...)
USER-IDENTIFICATION = *OWN / <name 1...8>
,SUBJECT = *STD /<c-string 1...256>
,DELETE-FILE = *YES / *NO / *DESTROY
,BATCH-PROCESSING = *YES (...) / *NO
*YES(...)
CPU-LIMIT = 500 / <integer 1..32767 seconds>
,MAREN-PASSWORD = *NONE / <c-string 1..4> / <x-string 1..8> /
<integer -2147483648..2147483647> / *SECRET

(part 2 of 2)

Operands

VOLUME =
Archive numbers of tapes about which information is required.

VOLUME = *ALL
All tapes are processed.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the MAREN program interface.

SELECT =
Specifies which catalog entries are to be added to the list. Preselection may already have been carried out using the VOLUME parameter.

SELECT = *NO
No selection criteria.

SELECT = *YES (...)

PARAMETER-SET =
Specifies the selection criteria to be used.

PARAMETER-SET = STD
All records are output.

PARAMETER-SET = <name 1..15>
Name of the parameter set containing the selection criteria.

PARAMETER-FILE = *STD / <filename 1..54>
See notes on page 355.

UPDATE =
Specifies whether the parameter set is to be modified before it is used.

UPDATE = *NO
The parameter set is not modified.

UPDATE = *PERMANENT
The parameter set is modified before use. The modified parameter set is written to the parameter file. If the parameter set does not yet exist, it is created.

UPDATE = *TEMPORARY
*Relevant only in connection with BATCH-PROCESSING=*NO.*
The parameter set is modified before use. It is not written to the parameter file.

SORT =
Specifies whether sort criteria are to be used.

SORT = *NO
No sort criteria.

SORT = *YES(...)

PARAMETER-SET =
Specifies which sort criteria are to be used.

PARAMETER-SET = STD
The default sort criteria are used.

PARAMETER-SET = <name 1..15>
Name of the parameter set containing the sort criteria.

PARAMETER-FILE = *STD / <filename 1..54>
LMS library for saving the parameter sets. See notes on page 355.

UPDATE =
Specifies whether the parameter set is to be modified before it is used.

UPDATE = *NO
The parameter set is not modified.

UPDATE = *PERMANENT
The parameter set is modified before use. The modified parameter set is written to the parameter file. If the parameter set does not yet exist, it is created.

UPDATE = *TEMPORARY
*Relevant only in connection with BATCH-PROCESSING=*NO.*
The parameter set is modified before use. It is not written to the parameter file.

LAYOUT-CONTROL =
Specifies whether the file is to be edited for printing, which parameter files are to be used, and in what way.

LAYOUT-CONTROL = *YES(...)
The output file is to be edited for printing with printer control characters, headers, page numbers, etc.

PARAMETER-SET =
Specifies the layout to be used.

PARAMETER-SET = STD
The default layout is to be used.

PARAMETER-SET = <name 1..15>
Name of the parameter set containing the layout.

PARAMETER-FILE = *STD / <filename 1..54>
See notes on page 355.

UPDATE =
Specifies whether the parameter set is to be modified before it is used.

UPDATE = *NO
The parameter set is not modified.

UPDATE = *PERMANENT(...)
The parameter set is modified before use. The modified parameter set is written to the parameter file. If the parameter set does not yet exist, it is created.

UPDATE-HEADER =
Specifies if the display of headers 2 and 3 is to be recalculated by MAREN or if the existing headers in the mask “Entering the layout parameters (structure of header lines):” on page 360 are to be suggested.

UPDATE-HEADER = *STD
Headers 2 and 3 will be created by MAREN.

UPDATE-HEADER = *OLD
Headers 2 and 3 are taken from an existing parameter record. If there is no parameter record, then the response is the same as when UPDATE-HEADER=*STD is used.

UPDATE = *TEMPORARY(...)
*Relevant only in connection with BATCH-PROCESSING=*NO.*
The parameter set is modified before use. It is not written to the parameter file.

UPDATE-HEADER =
Specifies if the display of headers 2 and 3 is to be recalculated by MAREN or if the existing headers in the mask "Entering the layout parameters (structure of header lines):" on page 360 are to be suggested.

UPDATE-HEADER = *STD
Headers 2 and 3 will be created by MAREN.

UPDATE-HEADER = *OLD
Headers 2 and 3 are taken from an existing parameter record. If there is no parameter record, then the response is the same as when UPDATE-HEADER=*STD is used.

START-PRINT =
Specifies whether the output file is to be printed immediately.

START-PRINT = *YES(...)
Specifies that the output file is to be automatically printed immediately.

As output files in CSV format cannot be printed out, START-PRINT=*NO is assumed in this case.

SPOOLOUT-NAME = *NONE / <alphanum-name 1..8>
Job name to be assigned to the spoolout task. This name will also appear on the header page.

SPOOLOUT-NAME = *NONE
No special job name. If a job name was assigned to the job that issued the spoolout job, this name is used.

DELETE-FILE = *YES / *NO / *DESTROY
Specifies whether the output file is to be deleted after it has been printed.

If this entry contradicts the DELETE-FILE operand in SEND-BY-MAIL=*YES(...), DELETE-FILE=*NO is assumed implicitly.

TO-PRINTER =
Specifies which printer is to be used for printing.

TO-PRINTER = *STD
The printout will be output on the standard system printer.

TO-PRINTER = *PRINTER-NAME(...)
The printout will be output on a specific printer.

PRINTER-NAME = <alphanum-name 1..8>
Name of the printer used for printing.

TO-PRINTER = *PRINTER-POOL(...)
The print job will be sent to a printer pool.

PRINTER-POOL = <alphanum-name 1..8>
Name of the printer pool to which the print job was sent.

FORM-NAME =
Specifies which form will be used for printing. Standard forms must be defined for all printer types in the SPOOL parameter file.

FORM-NAME = *STD
The standard form is used for printing.

FORM-NAME = <alphanum-name 1..6>
Name of the form used when printing.

START-PRINT = *NO
Specifies that the output file is not to be printed automatically.

LAYOUT-CONTROL = *NO
Specifies that the output file is not to be edited for printing, i.e. all selected catalog entries are transferred unformatted to the output file.

OUTPUT =
Determines the name of the output file and, if required, other details regarding the output format and transfer by email.

OUTPUT = *STD(...)
Output is directed to a file with the name MAREN.PRINT.yyyymmdd.hhmmss (where yyyymmdd = date and hhmmss = time).

FORMAT =
Determines the format of the output file.

FORMAT = *MAREN-STRUCTURE
Output takes place in MAREN format.

FORMAT = *CSV(…)
*START-PRINT=*NO is always assumed for files in CSV format.*
Output takes place in CSV (comma separated value) format. Files in CSV format can be read in so that the columns are retained, and they can be processed further with a spreadsheet program (e.g. EXCEL).

SEPARATOR = *SEMICOLON / *COMMA
Determines the separator which is to be set between the various output values. The default separator is a semicolon (;). Optionally a comma (,) can be used as the separator.

HEADER-LINE = *YES / *NO
Specifies whether a header line should be output to name the output columns. The default is *YES, i.e. the header line is output. The header line contains the names of the catalog entry fields.

SEND-BY-MAIL = *NO / *YES(...)
Specifies whether the output file should be sent by email. The default is *NO, i.e. it is not sent by email. Transfer by email takes place only if the file to be sent contains at least one entry.

SEND-BY-MAIL = *YES(...)
The output file should be sent as an email attachment. The recipient is addressed by means of his/her user ID, i.e. the email address is taken from the user entry concerned.

TO = *USER(...)
Details of transfer by email:

USER-IDENTIFICATION = *OWN / <name 1...8>
Specifies the user ID. The recipient's email address is taken over from this user entry. If the user entry contains more than one email address, all the addresses are taken over as recipients. The default is *OWN, i.e. the caller's user ID.

SUBJECT = *STD / <c-string 1...256>
Determines the content of the email's "Subject" field. The default is *STD, i.e. MAREN uses a standard text, such as `MARENADM STATEMENT PRINT-VOLUME-ATTRIBUTES, FILENAME: <filename>`.

DELETE-FILE = *YES / *NO / *DESTROY
Specifies whether the file should be automatically deleted after it has been sent. *YES (default) causes the file to be deleted after it has been sent. *DESTROY also causes it to be deleted, and the memory space is overwritten with binary zeros.


If this entry contradicts the DELETE-FILE operand in START-PRINT=*YES(...), DELETE-FILE=*NO is assumed implicitly.

OUTPUT = <filename 1..54>
Only for specifying a file generation.
Output is directed to the specified file generation in MAREN format.

OUTPUT = <filename 1..54 without-gen-vers>(...)
Output is directed to the specified file.

FORMAT = *MAREN-STRUCTURE / *CSV(…)
Determines the format of the output file. The default is output in MAREN format.
Output in CSV format is described under the OUTPUT=*STD(...) operand on page 351.

SEND-BY-MAIL = *NO / *YES(...)
Specifies whether the output file should be sent by email. The default is *NO, i.e. it is not sent by email.
Transfer by email is described under the OUTPUT=*STD(...) operand on page 352.

BATCH-PROCESSING =
This option allows the output file to be created in a separate ENTER job, thus avoiding long wait times at the terminal. In this case, the MARENADM must not be protected with an EXEC-PASSWORD.

BATCH-PROCESSING = *YES(...)
The output file is to be created in a batch job.

CPU-LIMIT = 500 / <integer 1..32767 *seconds*>
Maximum CPU time in seconds allocated for the batch job.

MAREN-PASSWORD = *NONE / <c-string 1..4> / <x-string 1..8 / <integer -2147483648..2147483647> / *SECRET
Password authorizing the execution of administrator functions within in MAREN. If MAREN is password-protected, the MAREN password for any batch job running separately must be specified here.

MAREN-PASSWORD = *NONE
No password is specified.

MAREN-PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

BATCH-PROCESSING = *NO
Specifies that no separate batch job is to be started.

Notes

The layout of a list and the way in which the selected catalog entries are sorted are determined by specifying parameter sets. These parameter sets can be freely defined by means of screen masks, and can be re-used at a later date.

The layout, selection, and sort parameters are combined to form a parameter set, which is assigned a name of up to 6 characters in length. The parameter sets are stored as S elements in the LMS library specified in the PARAMETER-FILE operand. Querying of the table of contents, deleting or copying parameter sets, etc. can only be performed with the LMS program (see the “LMS” manual [16]).

In MAREN, the parameter set with the highest version number is used. A parameter set of the current version is always written. Modifications made to a parameter set of an earlier version are not saved, even when it is initially used as a template. A modified parameter set of an earlier version is therefore stored in the current version and the relevant parameter set in the earlier version remains unchanged.

In a batch job, the parameter sets are not modified before use. In interactive mode, the records can be modified temporarily (for the current printout only) or permanently (saved to a separate parameter file). The creation and modification of parameter sets are only possible if a print file is subsequently created (unless creation of the print file is aborted).

If domains are used, the DA is shown free tapes either from the standard domain or from his/her own domain. This is dependent on which value the domain-specific FREE-VOLUMES operand has.
The ADA is shown free tapes of all domains provided that he/she has not defined any restrictions using the Select parameter.

For each parameter set, the user can specify the parameter file to be used for reading or writing. If no file is specified, the file `MAREN.PARAMETER-FILE` is used under the calling user ID. If this file is not available or does not contain the specified record, the file `$SYSMAREN.MAREN.PARAMETER-FILE` is used or, if IMON is available, the file linked with the logical ID `SYSPAR.PRINT`. If neither of these files exists, the default parameters are used.

The following applies to the individual parameters:

- **Select parameters**

  A comparison string and a comparison operator (EQ,NE,LT,GT,LE,GE,=,<,>,<=,>=) can be defined for each catalog entry field. Only those catalog entries for which all comparison criteria are fulfilled are selected. Partially qualified comparison strings are permitted. The end of a partially qualified string is indicated by an asterisk (*). Partial qualification is not permitted for numeric catalog entry fields. Leading zeros can be ignored.

  Two formats are permitted for date fields:

  1. Absolute date in the format `yyyy-mm-dd`. The minimum entry is the year specification and the following hyphen.
  2. Relative date of up to four digits with a positive (optional) or negative sign. The absolute date is calculated from the relative date and the current date when the PRINT-VOLUME-ATTRIBUTES statement is executed. The absolute date thus calculated is used for comparison.

  The number of catalog entries can be further restricted by means of the parameter VOLUME = *INTERVAL(...) .

  Catalog fields which do not appear in the list can also be used for selection purposes. The catalog entry fields selected are labeled with “s” in the follow-on masks SORT and LAYOUT.

- **Sort parameters**

  The user can specify up to ten catalog entry fields which are to be used for sorting. The sort hierarchy (if more than one sort field is specified) and sort direction (“A”: ascending/”D”: descending) can be specified.

  Catalog fields which do not appear in the list can also be used for sorting purposes. The catalog entry fields selected are labeled with “o” in the follow-on mask LAYOUT.

- **Layout parameters**

  One line (of max. 240 characters) can be output for each catalog entry. The mask allows the user to define which catalog entry fields are to be used in the output line, together with the sequence and length (shorter or longer than the catalog entry) in which they are to be output. The separators between columns can be freely defined.

  A follow-on mask suggests a two-line header based on the selected column structure. It can be changed as required. The line length is determined by the sum of the catalog entry field lengths together with the separators. A page header can also be freely defined.

The following variables can be used in the header:
&DATE Date of creation of the list
&TIME Time
&PAGE Page number

- **Default parameter sets**

  A default layout parameter set is stored in the MARENADM program.

  This default layout has no effect if a layout parameter set with the name STD is contained in the parameter files under the calling user ID or in the global parameter file. This allows the data center or user to define individual default parameters.

Examples

Example 1

`//print-volume-attributes`

If the statement is entered without operands, MAREN first searches for the default parameter set for creating a print file under the calling user ID. If the default parameter set is not available there, it searches under the user ID SYSMAREN or, if IMON is used, the file with the logical name `SYSPAR.PRINT`.

If a default own parameter set has been defined, this layout is used when generating the list. If neither the caller nor the MAREN administrator has defined a default parameter set, a list is generated using the default layout defined in MAREN. This list contains all tapes of the caller's user ID and is sorted according to archive number.

```
A|MAREN <version>                                                                                                  <date> <time>     PAGE     1|
 |------------------------------------------------------------------------------------------------------------------------------------------|
 |VOLUME|FSEQ|DEV-TYPE|          REMARK          |U|P|ACC-|VOLUME-    |FILE/DIR-NAME (SHORTENED)       |CREATION  |LAST-ACC  |HOME-    |E|
 |      |    |        |                          |A|W|CNT |FREEDATE   |                                |-DATE     |-DATE     |LOCATION|X|
 |------------------------------------------------------------------------------------------------------------------------------------------|
 |      |    |        |                          | | |    |           |                                |          |          |        | |
 |AB09CD|   1|TAPE-C4 |                          |0|  |   0|<date>     |LST.E-TPM.Z9592                 |          |<date>    |ROBABBA1| |
 |AB10CD|   1|TAPE-C4 |                          |0|  |   0|<date>     |                                |          |          |ROBABBA1| |
 |AB11CD|   1|TAPE-C4 |                          |0|  |   0|           |                                |          |          |ROBABBA1| |
 |B     |   1|TAPE-C4 |                          |0|  |   0|<date>     |                                |          |<date>    |ROBABBA1| |
 |BLDTSR|   1|TAPE-C4 |                          |0|  |   0|           |                                |          |          |CENTRAL | |
 |      |    |        |                          | | |    |           |                                |          |          |        | |
 |BLD001|   1|TAPE-C1 |                          |0|  |   0|           |                                |          |<date>    |CENTRAL |Y|
 |B14753|   1|TAPE-C1 |                          |0|  |  15|           |                                |          |<date>    |MANUAL  | |

   ...

 |------------------------------------------------------------------------------------------------------------------------------------------|
A|MAREN <version>                                                                                                  <date> <time>     PAGE     1|
|-------------------------------------------------------------------------------------------------------------------------------------------|
 |VOLUME|FSEQ|DEV-TYPE|          REMARK          |U|P|ACC-|VOLUME-    |FILE/DIR-NAME (SHORTENED)       |CREATION  |LAST-ACC  |HOME-    |E|
 |      |    |        |                          |A|W|CNT |FREEDATE   |                                |-DATE     |-DATE     |LOCATION|X|
 |------------------------------------------------------------------------------------------------------------------------------------------|
 |      |    |        |                          | | |    |           |                                |          |          |        | |
 |TST018|   1|TAPE-C4 |                          |0|  |  2M|<date>     |:PI1B:$TSOS.CMA.BNF.DIR         |<date>    |<date>    |ROBABBA1| |
 |TST019|   1|TAPE-C4 |                          |0|  | 321|<date>     |                                |<date>    |<date>    |ROBABBA1| |
 |TST020|   1|TAPE-C4 |                          |0|  | 184|<date>     |:PI1B:$TSOS.ARF01.DIR           |<date>    |<date>    |ROBABBA1| |
 |TST021|   1|TAPE-C4 |                          |0|  | 39K|<date>     |                                |          |<date>    |ROBABBA1| |
 |TST022|   1|TAPE-C4 |                          |0|  | 215|<date>     |:SMP2:$TSOS.CSF03.DIR           |<date>    |<date>    |ROBABBA1| |
 |      |    |        |                          | | |    |           |                                |          |          |        | |

   ...

 |WORK18|   1|TAPE-C2 |                          |0|  |   0|<date>     |                                |          |          |MANUAL  | |
 |WORK77|   1|T6250   |                          |0|  |   0|           |                                |          |<date>    |CENTRAL | |
 |WORK78|   1|T6250   |                          |0|  |   0|           |                                |          |<date>    |CENTRAL | |
 |ZZ2121|   1|TAPE-C2 |                          |0|  |   0|           |MRSY0009.TAPESET.2              |          |          |SECURE  | |
 |------------------------------------------------------------------------------------------------------------------------------------------|
 | TOTAL    215 MAREN CATALOG ENTRIES                                                                                                       |
 |------------------------------------------------------------------------------------------------------------------------------------------|
 |                                                                                                                                          |
 | THIS LIST WAS CREATED BY MARENADM (900) USING FOLLOWING PARAMETERS:                                                                      |
 |  INTERVAL : FROM=*FIRST TO=*LAST  FROM-FSEQ=0001                                                                                         |
 |  SELECT   : N                                                                                                                            |
 |  SORT     : N                                                                                                                            |
 |  LAYOUT   : PARAMETER-SET =STD    UPDATE=NO                                                                                              |
 |                     -FILE=*STD                                                                                                           |
 |------------------------------------------------------------------------------------------------------------------------------------------|
```

i The value of ACCESS-COUNT is output in at most 4 digits. Values greater than 9999 are represented by “nnnK” or “nnM”.

Example 2

A list containing all tapes whose expiration dates will fall in the next 10 days is to be generated. The list is to be sorted in descending order according to the date each volume was last accessed, and then in ascending order according to file names.

It is to contain the following information:
FREE-DATE
VOLUME
FILE-NAME (30 characters long)
CREATION-DATE
LAST-ACCESS-DATE
INITIALIZATION

In order to ensure that the list can be generated again in the future with a minimum of effort, the information on selection, sorting, and layout is to be stored permanently in the default parameter file. The name of the parameter set should be “free10” for all three types (selection, sorting and layout).

Statement used to create the parameter set and the first list:

```
//print-volume-attributes sel=*yes(par-set=free10,update=*permanent),
   sort=*yes(par-set=free10,update=*permanent),
   layout-contr=*yes(par-set=free10,update=*permanent),batch-proc=*no
```

The following masks are displayed in the sequence shown. When the shaded values are entered, the next screen is displayed.

Entering the selection parameters:

```
SELECT-PAR-SET: FREE10          FILE:
FIELD      OP,TEXT
VOLUME      __ ______       FILE-SEQ       __ ____       DEV-TYPE     __ ________
USER-ID     __ ________     HOME-LOCATION  __ ________   RESERV-DATE  __ __________
ACCOUNT     __ ________     FREE-LOCATION  __ ________   FREE-DATE   <= +10_______
USER-ACC    __ ________     TEMP-LOCATION  __ ________   EXPIR-DATE   __ __________
PASSWORD    __ _                                       AUDIT        __ _
EXP-AD/DAT  __ ____________________________________________________ /__ __________
REMARK      __ _____________________ 2 __ __________ 3 __ ____________
USER-FIELD  __ ____________________________________________________
FILE-NAME   __ ____________________________________________________
FREE-POOL   __ ____________________________________________________
SAVE-FILE   __ _____________ SUB-SV/SQ__ __/__ ___   JOB/REQ-NAM __ ________
VOL-GROUP   __ ____________________________           L-A-DATE     __ __________
VOL-SEQ     __ ____         CR-DATE      __ _________ L-A-TIME     __ ________
FIRST-VOL   __ ______       CR-TIME      __ ________  L-A-USER-ID  __ ________
DEV-NAME    __ ____         LA-CL-DATE   __ _________ L-A-ACCOUNT  __ ________
OPEN-MODE   __ __           LA-CL-TIME   __ ________  L-A-JOB-NAM  __ ________
CLOSE-IND   __ _            CR-CAT-ID    __ ____      L-A-TSN      __ ____
VOL-STATUS  __ _            CR-USER-ID   __ ________  L-A-SNO      __ ___
INIT        __ _            RES-COUNT    __ ____      L-A-HOSTNAM  __ ________
REG-DATE    __ __________   ACCES-COUNT  __ ____      L-W-BLK-CNT  __ __________
DIR-ON-VOL  __ _            CHECK-COUNT  __ __        L-A-FU-NAME  __ ________
ADM-FIELD   __ ________   /2 __ _________________     L-A-FU-FLAG  __ __
```

Entering the sort parameters:

```
SORT-PAR-SET: FREE10          FILE:
FIELD         NR,A/D
VOLUME....... __ _       FILE-SEQ....... __ _      DEV-TYPE........... __ _
USER-ID...... __ _       HOME-LOCATION.. __ _      RESERV-DATE........ __ _
ACCOUNT...... __ _       FREE-LOCATION.. __ _      FREE-DATE.......... __ _ s
USER-ACC..... __ _       TEMP-LOCATION.. __ _      EXPIRATION-DATE.... __ _
PASSWORD..... __ _                                 AUDIT.............. __ _
EXPORT-AD.... __ _       EXPORT-DATE.... __ _
REMARK....... __ _       REMARK-2....... __ _      REMARK-3........... __ _
USER-FIELD... __ _
FILE-NAME.... _2 a       FREE-POOL...... __ _      SAVE-FILE.......... __ _
SUB-SAVE..... __ _       SUB-SEQUENCE... __ _      CR-JOB-/REQ-NAME... __ _
VOLUME-GROUP. __ _                                 LAST-ACC-DATE...... _1 d
VOL-SEQ...... __ _       CR-DATE........ __ _      LAST-ACC-TIME...... __ _
FIRST-VOL.... __ _       CR-TIME........ __ _      LAST-ACC-USER-ID... __ _
DEV-NAME..... __ _       LAST-CL-DATE... __ _      LAST-ACC-ACCOUNT... __ _
OPEN-MODE.... __ _       LAST-CL-TIME... __ _      LAST-ACC-JOB-NAME.. __ _
CLOSE-IND.... __ _       CR-CAT-ID...... __ _      LAST-ACC-TSN....... __ _
VOL-STATUS... __ _       CR-USER-ID..... __ _      LAST-ACC-SNO....... __ _
INIT......... __ _       RESERV-COUNT... __ _      LAST-ACC-HOSTNAME.. __ _
REG-DATE..... __ _       ACCESS-COUNT... __ _      LAST-WRITE-BLK-CNT. __ _
DIR-ON-VOL... __ _       CHECK-COUNT.... __ __     LAST-ACC-FUNC-NAME. __ _
ADM-FIELD.... __ _       ADM-FIELD-2.... __ _      LAST-ACC-FUNC-FLAG. __ _
```

Entering the layout parameters (structure of individual lines):

```
LAYOUT-PAR-SET: FREE10          FILE:
FIELD          NR,LEN
VOLUME........ _2 _6      FILE-SEQ....... __ _4     DEV-TYPE........... __ _8
USER-ID...... __ _8       HOME-LOCATION.. __ _8     RESERV-DATE........ __ _1
ACCOUNT...... __ _8       FREE-LOCATION.. __ _8     FREE-DATE.......... _1 10 s
USER-ACC..... __ _1       TEMP-LOCATION.. __ _8     EXPIRATION-DATE.... __ 10
PASSWORD..... __ _1                                  AUDIT.............. __ _1
EXPORT-AD.... __ 50       EXPORT-DATE.... __ 10
REMARK....... __ 24       REMARK-2....... __ 10     REMARK-3........... __ 12
USER-FIELD... __ 54
FILE-NAME.... _3 30 o     FREE-POOL...... __ 54     SAVE-FILE.......... __ 15
SUB-SAVE..... __ _2       SUB-SEQUENCE... __ _3     CR-JOB-/REQ-NAME... __ _8
VOLUME-GROUP. __ 32                                  LAST-ACC-DATE...... 11 10 o
VOL-SEQ...... __ _4       CR-DATE........ _4 10     LAST-ACC-TIME...... __ _8
FIRST-VOL.... __ _6       CR-TIME........ __ _8     LAST-ACC-USER-ID... __ _8
DEV-NAME..... __ _2       LAST-CL-DATE... __ 10     LAST-ACC-ACCOUNT... __ _8
OPEN-MODE.... __ _2       LAST-CL-TIME... __ _8     LAST-ACC-JOB-NAME.. __ _8
CLOSE-IND.... __ _1       CR-CAT-ID...... __ _4     LAST-ACC-TSN....... __ _4
VOL-STATUS... __ _7       CR-USER-ID..... __ _8     LAST-ACC-SNO....... __ _3
INIT......... _6 _1       RESERV-COUNT... __ _4     LAST-ACC-HOSTNAME.. __ _8
REG-DATE..... __ 10       ACCESS-COUNT... __ _4     LAST-WRITE-BLK-CNT. __ _4
DIR-ON-VOL... __ _1       CHECK-COUNT.... __ _2     LAST-ACC-FUNC-NAME. __ _8
ADM-FIELD.... __ _8       ADM-FIELD-2.... __ 16     LAST-ACC-FUNC-FLAG. __ _2
SEPARATOR=|
```

Entering the layout parameters (structure of header lines):

```
LAYOUT-PARAMETER-SET: FREE10  FILE:
HEADER-LINES

1ST LINE:
Free within 10 days                    &DATE              &PAGE



2ND LINE:
|FREE-     |VOLUME|FILE-NAME                    |CR-       |L-A-      |I|



3RD LINE:
|DATE       |      |                             |DATE      |DATE      | |



PROPOSAL FOR 2ND LINE:
|FREE-     |VOLUME|FILE-NAME                    |CR-       |L-A-      |I|



LINE LENGTH   74
```

The generated list looks like this:

```
AFree within 10 days                    <date>                 1          |
 |-------------------------------------------------------------------------|
 |FREE-     |VOLUME|FILE-NAME                        |CR-       |L-A-      |I|
 |DATE      |      |                                 |DATE      |DATE      | |
 |----------|------|---------------------------------|----------|----------|-|
 |          |      |                                 |          |          | |
 |          |BLD001|                                 |          |<date>    |N|
 |<date>    |TST005|                                 |<date>    |<date>    |Y|
 |<date>    |TST013|                                 |<date>    |<date>    |Y|
 |<date>    |TST014|                                 |<date>    |<date>    |Y|
 |<date>    |TST017|                                 |<date>    |<date>    |Y|
 |          |      |                                 |          |          | |
 |<date>    |TST019|                                 |<date>    |<date>    |Y|
 |<date>    |TST021|                                 |          |<date>    |Y|
 |<date>    |TST024|                                 |<date>    |<date>    |Y|
 |<date>    |TST025|                                 |<date>    |<date>    |Y|
 |<date>    |TST026|                                 |          |<date>    |Y|
 |          |      |                                 |          |          | |

   ...

 |-------------------------------------------------------------------------|
AFree within 10 days                    <date>                 5          |
 |-------------------------------------------------------------------------|
 |FREE-     |VOLUME|FILE-NAME                        |CR-       |L-A-      |I|
 |DATE      |      |                                 |DATE      |DATE      | |
 |----------|------|---------------------------------|----------|----------|-|
 |          |      |                                 |          |          | |
 |<date>    |MOD009|                                 |          |          |Y|
 |<date>    |MOD010|                                 |          |          |Y|
 |<date>    |REGD01|                                 |          |          |Y|
 |<date>    |SPCC08|                                 |          |          |Y|
 |<date>    |TLS029|                                 |          |          |Y|
   ...
 |          |      |                                 |          |          | |
 |<date>    |THC006|ARCHIVE.SAVE.FILE(980909-13554|          |          |Y|
 |<date>    |WORK12|ARCHIVE.SAVE.FILE(990421-19134|          |          |Y|
 |<date>    |V01020|LOG.ERNEST.16.15.59              |          |          |Y|
 |<date>    |TAR001|MAREN.SCRATCH.TAPE               |          |          |N|
 |<date>    |TAR002|MAREN.SCRATCH.TAPE               |          |          |N|
 |          |      |                                 |          |          | |
 |          |ZZ2121|MRSY0009.TAPESET.2               |          |          |N|
 |-------------------------------------------------------------------------|
 | TOTAL    211 MAREN CATALOG ENTRIES                                     |
 |-------------------------------------------------------------------------|
 |                                                                         |
 | THIS LIST WAS CREATED BY MARENADM (810) USING FOLLOWING PARAMETERS:     |
 |  INTERVAL : FROM=*FIRST TO=*LAST  FROM-FSEQ=0001                        |
 |  SELECT   : PARAMETER-SET =FREE10 UPDATE=NO                             |
 |                     -FILE=*STD                                          |
 |  SORT     : PARAMETER-SET =FREE10 UPDATE=NO                             |
 |                     -FILE=*STD                                          |
 |  LAYOUT   : PARAMETER-SET =FREE10 UPDATE=NO                             |
 |                     -FILE=*STD                                          |
 |-------------------------------------------------------------------------|
```

After the statement has been executed, the generated list is output to a printer.

The list can be generated again at a later point in time (without having to fill out masks) with the same format, e.g. with the statement below in a batch task:

```
//print-vol-attr sel=*yes(par-set=free10),sort=*yes(par-set=free10),
   layout-contr=*yes(par-set=free10)
```

REMOVE-FOREIGN-DEVICE-TYPE
Remove foreign device type from MAREN

Privilege ADA, administrator without domains

This statement is used to remove a foreign device type from the administration in MAREN. Catalog entries are not modified or deleted in the process.

Only device types which had been added beforehand with ADD-FOREIGN-DEVICE-TYPE can be removed.

Format

REMOVE-**FOREIGN**-**DEV**ICE-**TYPE**	Alias: **RMFDT**
DEVICE-**TYPE** = <structured-name 1..8>	

Operands

DEVICE-TYPE = <structured-name 1..8>
Specifies the name under which the foreign device type is administered.

REMOVE-FREE-VOLUMES
Delete catalog entries of free tapes from the MAREN catalog

Privilege ADA, administrator without domains

This statement deletes the catalog entries of free tapes from the MAREN catalog.

Tapes of an archive system must be exported before they are deleted. Otherwise the message MARM015 is issued for the tapes concerned:

Format

REMOVE-**FREE-VOL**UMES Alias: **RMFV**

VOLUME = ***ALL** / ***INT**ERVAL(...) / <vsn>

***INT**ERVAL(...)
| **FROM** = ***FIRST** / <vsn>
| ,**TO** = ***LAST** / <vsn>
| ,**FROM-FSEQ** = 1 / <integer 1..9999>

,**SELECT** = ***STD** / ***BY-ATTR**IBUTES(...)

***BY-ATTR**IBUTES(...)
| **FREE-LOC**ATION = ***ALL** / <alphanum-name 1..8>
| ,**DEV**ICE-**TYPE** = ***STD** / <structured-name 1..8>
| ,**FREE-POOL** = ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> /
| <text 2..32 without-sep>

,**DOM**AIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

Operands

VOLUME =
Archive numbers of the free tapes whose catalog entry is to be deleted.

VOLUME = *ALL
All tapes are processed.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

VOLUME = <vsn>
Archive number.

SELECT =
Specifies which catalog entries are to be processed.

SELECT = *STD
Specifies that processing is not restricted to any particular location for free tapes.

SELECT = *BY-ATTRIBUTES(...)

FREE-LOCATION = *ALL / <alphanum-name 1..8>
Location name or symbolic location name. All catalog entries with the specified location for free tapes are processed.

FREE-LOCATION = *ALL
Processing is not restricted to any particular location for free tapes.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
Only tapes of the default device type (DEFAULT-DEVICE-TYPE) are selected whose value was specified in the MODIFY-MAREN-PARAMETERS statement.

DEVICE-TYPE = <structured-name 1..8>
Device type. Which types can be specified depends on the BS2000 version (see the manual “System Installation” [6]). In addition, foreign device types can be specified which have been made known using the ADD-FOREIGN-DEVICE-TYPE statement. Device type TAPE-UxE is not permissible as free tapes are not encrypted.

FREE-POOL =
Selects the catalog entries of free tapes to be deleted on the basis of the free tape pool.

FREE-POOL = *NO
Only free tapes assigned to the *NO free tape pool are selected.

FREE-POOL = *GLOBAL
Only free tapes assigned to the *GLOBAL free tape pool are selected.

FREE-POOL = *TSOS
Only free tapes assigned to the *TSOS free tape pool are selected.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
Only free tapes assigned to the free tape pool for HSMS/ARCHIVE applications using the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other.

DOMAIN =
Specifies the domain whose tapes are to be processed.

DOMAIN = *STD-DOMAIN
The tapes of the standard domain are processed.

DOMAIN = *OWN
The tapes of the user's own domain are processed.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
The tapes of the specified domain are processed.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Examples

```
//remove-free-vol vol=(tape05,tape06)
%  MARM106 MAREN CATALOG ENTRY 'TAPE05'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'TAPE06'/'0001' ERASED
%  MARM104 TOTAL OF 2 MAREN CATALOG ENTRIES ERASED
```

The archive numbers of the free tapes tape05 and tape06 are deleted from the MAREN catalog.

```
//remove-free-vol vol=*int(id0001,id0100),sel=*by-attr(free-loc=cpu11)
%  MARM106 MAREN CATALOG ENTRY 'ID0003'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0004'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0005'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0006'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0007'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0008'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0009'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0010'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0011'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0012'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0013'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0014'/'0001' ERASED
%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)y
%  MARM106 MAREN CATALOG ENTRY 'ID0015'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0016'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0017'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0018'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0019'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0020'/'0001' ERASED
%  MARM104 TOTAL OF 18 MAREN CATALOG ENTRIES ERASED
```

From the set of all free tapes of the standard device type assigned to the tape location CPU11, all archive numbers in the value range ID0001 through ID0100 are removed.

REMOVE-HOST
Remove system from the MAREN network

Privilege ADA, administrator without domains

The statement removes a system and its system-specific parameters from the MAREN catalog and thus from the MAREN network.

The following applies when domains are used: If tapes are still assigned to the system which is removed, these tapes remain assigned to the system's domain. Tapes can remain assigned to a domain even though no system is now assigned to this domain.

Format

REMOVE-**HOST**	Alias: **RMHO**
HOST = <alphanum-name 1..8>	

Operands

HOST = <alphanum-name 1..8>
Specifies the name of the system which is to be removed.

MAREN cannot check whether the specified system exists. You must therefore take special care that the system name is entered correctly.

REMOVE-USER-VOLUMES
Remove catalog entries of a user from the MAREN catalog

Privilege ADA, administrator without domains

This statement deletes all catalog entries under a specific user ID and, when required, transfers them to a file.

Format

REMOVE-**USER-VOL**UMES Alias: **RMUV**

USER-IDENTIFICATION = <name 1..8>

,**ACCOUNT** = ***ALL** / <alphanum-name 1..8>

,**DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

,**OUTP**UT = ***SYSOUT** / <filename 1..54 without-gen-vers>(...)

<filename 1..54 without-gen-vers>(...)

NEW-HOME-LOCATION = ***UNCH**ANGED / <alphanum-name 1..8>

,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

Operands

USER-IDENTIFICATION = <name 1..8>
User ID whose catalog entries are to be deleted from the MAREN catalog.

ACCOUNT = *ALL / <alphanum-name 1..8>
Account number. Under the specified user ID, only those catalog entries which are assigned to the specified account number are deleted.

ACCOUNT = *ALL
All account numbers of the user ID.

DOMAIN =
Only those catalog entries are removed from the specified user ID which are assigned to the specified domain.

DOMAIN = *STD-DOMAIN
Only the catalog entries of the standard domain are deleted.

DOMAIN = *OWN
Only the catalog entries of the user's own domain are deleted.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
Only the catalog entries of the specified domain are deleted.

OUTPUT =
Determines the output medium. Output to SYSOUT is the default.

OUTPUT = *SYSOUT
The deleted catalog entries are logged to SYSOUT.

OUTPUT = <filename 1..54 without-gen-vers>(...)
Name of an output file. The deleted catalog entries are written to the specified file. The file type is SAM.

NEW-HOME-LOCATION = *UNCHANGED / <alphanum-name 1..8>
Location name or symbolic location name. Specifies location where the tapes are normally to be stored once they have been returned to the MAREN catalog.

NEW-HOME-LOCATION = *UNCHANGED
The previous location names are transferred to the output file unchanged.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- Tapes of an archive system must be exported before they are deleted. Otherwise the message MARM015 is issued for the tapes concerned.
- Each deleted catalog entry is logged.
- If NEW-HOME-LOCATION is specified, this value is set for HOME-LOCATION, FREE-LOCATION, and TEMPORARY-LOCATION in the catalog entry.
- If MARENADM is executed under the user ID TSOS, the passwords are written to the output file in plain text. Otherwise, any existing passwords are overwritten with C'$$$$'.
- If a temporarily locked catalog entry exists for an entry to be deleted, it is likewise deleted if it belongs to the defined user ID and account number.
- The spin off mechanism is triggered if a catalog entry cannot be deleted.

Example

```
//remove-user-volumes user-id=user1,output=lst.remove.user1
%  MARM106 MAREN CATALOG ENTRY 'ID0001'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID0101'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID1100'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID1101'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID1102'/'0001' ERASED
%  MARM106 MAREN CATALOG ENTRY 'ID1103'/'0001' ERASED
%  MARM104 TOTAL OF 6 MAREN CATALOG ENTRIES ERASED
%  MARM119 FILE 'LST.REMOVE.USER1' WITH 6 RECORDS CREATED
```

All catalog entries of the ID user1 are saved unchanged to the file LST.REMOVE.USER1 and then removed from the MAREN catalog. Using the output file specified in the INPUT-FILE operand of the ADD-RESERVED-VOLUME statement, the catalog entries can be reconstructed or imported into another system.

RENAME-FOREIGN-DEVICE-TYPE
Rename foreign device type

Privilege ADA, administrator without domains

This statement is used to rename a foreign device type. The catalog entries which contain this type are not modified or deleted in the process.

Format

RENAME-FOREIGN-DEVICE**-TYPE**	Alias: **RNFDT**
DEVICE**-TYPE** = <structured-name 1..8> ,**NEW-DEV**ICE**-TYPE** = <structured-name 1..8>	

Operands

DEVICE-TYPE = <structured-name 1..8>
Specifies the name under which the foreign device has been administered to date.

NEW-DEVICE-TYPE = <structured-name 1..8>
Specifies any name under which the foreign device will be administered in future.

Notes

- Only foreign device types can be renamed. Device types which are known to the BS2000 are rejected.
- A change of version of the BS2000 can result in the following situation: The name of a foreign device type is identical to the name of a device type which is supported for the first time in the new BS2000 version. In this case the name of the previously foreign device type is modified by the statement. The new device type which is now known to the BS2000 remains unchanged.

RESERVE-FREE-VOLUME
Reserve free tapes

Privilege ADA, DA, administrator without domains

This statement reserves tapes from the free pool with the name *NO for the user's own user ID. The tape can be assigned specific protection attributes. Catalog entry fields can be assigned values.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

RESERVE-**FREE-VOL**UME Alias: **RSFV**

USER-IDENTIFICATION = <name 1..8>

,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>

,**NUMBER-OF-VOL**UMES = **1** / <integer 1..32767>

,**SELECT** = ***STD** / ***BY-ATTR**IBUTES(...)

***BY-ATTR**IBUTES(...)
- **VOL**UME = ***ALL** / ***INT**ERVAL(...)
  - ***INT**ERVAL(...)
    - **FROM** = ***FIRST** / <vsn>
    - ,**TO** = ***LAST** / <vsn>
- ,**DEV**ICE-**TYPE** = ***STD** / <structured-name 1..8>
- ,**HOME-LOCATION** = ***STD** / <alphanum-name 1..8>

,**PROTECTION** = ***STD** / ***PAR**AMETERS(...)

***PAR**AMETERS(...)
- **USER-ACCESS** = ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY / ***ALL-USERS**
- ,**FREE-DATE** = ***STD** / <date> / <integer 0..32767 *days*>

,**FI**LE-**NAME** = ***NONE** / <filename 1..41 without-cat-user>

,**DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

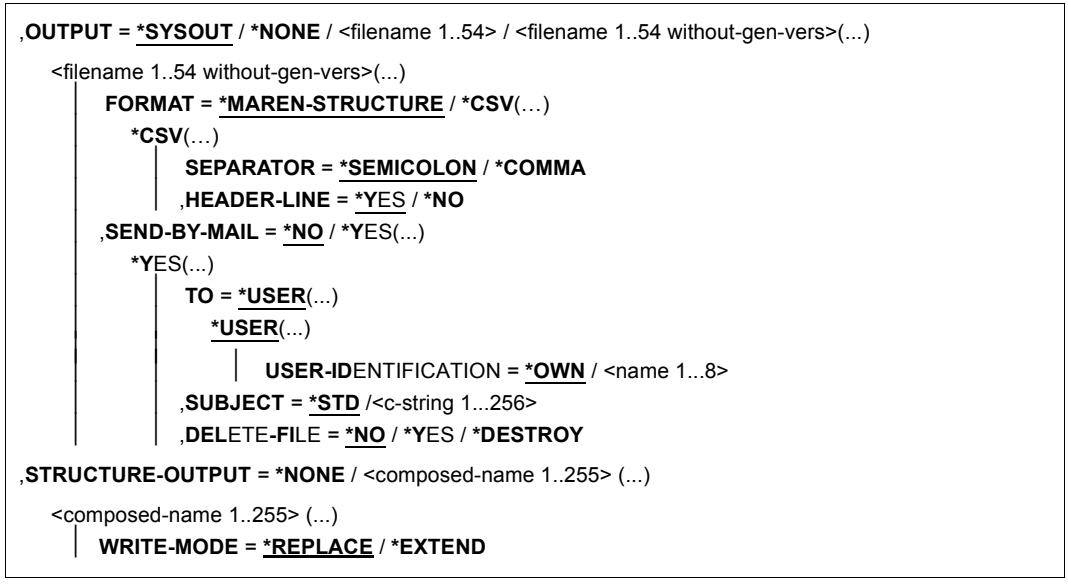
,**VOL**UME-**GR**OUP = ***NONE** / <text 1..32 without-sep>

,**REMARK** = ***NONE** / <c-string 1..24>

,**REMARK-2** = ***NONE** / <c-string 1..10>

,**REMARK-3** = ***NONE** / <c-string 1..12>

(part 1 of 2)



(part 2 of 2)

Operands

USER-IDENTIFICATION = <name 1..8>
User ID to which the volume is to be assigned.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number of the specified user ID.

NUMBER-OF-VOLUMES = 1 / <integer 1..32767>
Number of tapes. Specifies how many free tapes are to be reserved.

SELECT = *STD / *BY-ATTRIBUTES
Specifies the criteria to be used to select free tapes.

SELECT = *STD
The standard criteria listed below are used.

SELECT = *BY-ATTRIBUTES (...)

VOLUME =
Specifies a number range from which free tapes are to be selected.

VOLUME = *ALL
All tapes are processed.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
The tapes are of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified with the MODIFY-MAREN-PARAMETERS statement.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

HOME-LOCATION = *STD / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the archive from which the free tapes are to be selected.

HOME-LOCATION = *STD
The selection is made from the default permanent location defined by the MAREN administrator.

PROTECTION =
Tape protection attributes

PROTECTION = *STD
The default values described below are used.

PROTECTION = *PARAMETERS(...)

USER-ACCESS =
Specifies whether foreign user IDs may access the tape.

USER-ACCESS = *OWNER-ONLY
Access to the tape is possible only under the specified user ID.

USER-ACCESS = *FOREIGN-READ-ONLY
Only read access to the tape is possible under a foreign user ID.

USER-ACCESS = *ALL-USERS
Unrestricted access to the tape is possible under a foreign user ID.

FREE-DATE =
Expiration date of the tape. Up to this date, the tape remains reserved for the given user ID.

FREE-DATE = *STD
The reservation period defined by the MAREN administrator applies.

FREE-DATE = <date>
Date in the format `yyyy-mm-dd`.

FREE-DATE = <integer 0..32767 *days*>
Time specification in days. MAREN internally adds this number to the current date to generate the expiration date.

FILE-NAME = *NONE / <filename 1..41 without-cat-user>
Name of the file which is subsequently to be written to the tape.

DOMAIN =
Defines the domain for which the free tapes are reserved.

DOMAIN = *STD-DOMAIN
Free tapes are reserved for the standard domain.

DOMAIN = *OWN
Free tapes are reserved for the user's own domain.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
Free tapes are reserved for the specified domain.

VOLUME-GROUP = *NONE / <text 1..32 without-sep>
Specifies the volume group to which the newly reserve tape is assigned. When *NONE is specified, it is not assigned to a volume group.

REMARK = *NONE / <c-string 1..24>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

REMARK-2 = *NONE / <c-string 1..10>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

REMARK-3 = *NONE / <c-string 1..12>
Comment text. This catalog entry field is output in response to the MAREN statement SHOW-VOLUME-ATTRIBUTES.

OUTPUT =
Determines the output medium. Output to SYSOUT is the default.

OUTPUT = *SYSOUT
Output is directed to SYSOUT.

OUTPUT = *NONE
No output takes place. This specification only makes sense for structured output in an S variable (see the STRUCTURE-OUTPUT operand).

OUTPUT = <filename 1..54>
Only for specifying a file generation.
Output is directed to the specified file generation in MAREN format. Passwords are overwritten with C'$$$$'. Only the number of records written is displayed on SYSOUT.

OUTPUT = <filename 1..54 without-gen-vers>(...)
Name of the SAM output file to which all selected catalog entries are to be written. Passwords are overwritten with C'$$$$'. Only the number of records written is displayed on SYSOUT. The output format and transfer by email can also be specified.

FORMAT =
Determines the format of the output file.

FORMAT = *MAREN-STRUCTURE
Output takes place in MAREN format.

FORMAT = *CSV(…)
Output takes place in CSV (comma separated value) format. Files in CSV format can be read in so that the columns are retained, and they can be processed further with a spreadsheet program (e.g. EXCEL).

SEPARATOR = *SEMICOLON / *COMMA
Determines the separator which is to be set between the various output values. The default separator is a semicolon (;). Optionally a comma (,) can be used as the separator.

HEADER-LINE = *YES / *NO
Specifies whether a header line should be output to name the output columns. The default is *YES, i.e. the header line is output. The header line contains the names of the catalog entry fields.

SEND-BY-MAIL = *NO / *YES(...)
Specifies whether the output file should be sent by email. The default is *NO, i.e. it is not sent by email. Transfer by email takes place only if the file to be sent contains at least one entry.

SEND-BY-MAIL = *YES(...)
The output file should be sent as an email attachment. The recipient is addressed by means of his/her user ID, i.e. the email address is taken from the user entry concerned.

TO = *USER(...)
Details of transfer by email:

USER-IDENTIFICATION = *OWN / <name 1...8>
Specifies the user ID. The recipient's email address is taken over from this user entry. If the user entry contains more than one email address, all the addresses are taken over as recipients. The default is *OWN, i.e. the caller's user ID.

SUBJECT = *STD /<c-string 1...256>
Determines the content of the email's "Subject" field. The default is *STD, i.e. MAREN uses a standard text.

DELETE-FILE = *NO / *YES / *DESTROY
Specifies whether the file should be automatically deleted after it has been sent. The default is *NO, i.e. the file is not deleted. *YES causes the file to be deleted after it has been sent. *DESTROY also causes it to be deleted, and the memory space is overwritten with binary zeros.

STRUCTURE-OUTPUT =
Controls the structured output in S variables.

STRUCTURE-OUTPUT = *NONE
No structured output takes place.

STRUCTURE-OUTPUT = <composed-name 1..255> (...)
Name of the S variable to be used for the structured output.

WRITE-MODE =
Determines whether the output should replace or extend the current content of the S variables.

WRITE-MODE = *REPLACE
The current content of the S variable is replaced by the new output.

WRITE-MODE = *EXTEND
The new output extends the current content of the S variable.

Notes

- The statement is aborted and the spin off mechanism triggered if a specified device type is not permitted or the expiration date is before the current date. The spin off mechanism is likewise triggered if NUMBER-OF-VOLUMES has not been reached.
- Tapes that have not yet been “cleared up” (HOME-LOCATION is not the same as TEMP-LOCATION) can only be reserved on the local system on which they are located.
- The archive catalog entry fields ADMINISTRATOR-FIELD, ADMINISTR-FIELD-2, AUDIT, INITIALIZATION and ACCESS-COUNT remain unchanged. The value of RESERVATION-COUNT is incremented by 1.
- With the DEVICE-TYPE operand, no distinction is made between TAPE-C5 and TAPE-C6. Consequently, a type TAPE-C5 tape can be reserved when a type TAPE-C6 tape is requested.
- When a tape with the DEVICE-TYPE=TAPE-UxE is reserved, MAREN searches for a free tape of the type TAPE-Ux and changes its type to TAPE-UxE. In the case of tapes of the type TAPE-UxE the tape contents are encrypted when they are written. All read and write accesses must take place with DEVICE=TAPE-UxE. When the tape is released using FREE-VOLUMES, the volume type is reset to TAPE-Ux as the type TAPE-UxE only exists in the MAREN catalog for reserved tapes.

Example

```
//reserve-free-volume user=user2,acc=acc1,dev-type=tape-c4
%  MARM127 VOLUME 'TE645O' RESERVED FOR USER ID 'USER2'
%  MAROO84 WAITING TIME RUNOUT FOR MAREN TRANSACTION ACCEPTANCE
```

A tape of type TAPE-C4 is reserved for the user ID USER2 under the account number acc1. The reservation period corresponds to the DEFAULT-FREE-DATE operand. The tape is not shareable and the comment field of the archive record contains no catalog entry.

Output in S variables

This statement supports the structured output in S variables (controlled by the STRUCTURE-OUTPUT operand).

Further information on S variables is provided in the “Commands” manual [5].

Output information	Name of the S variable	T	Contents
Access counter (8-digit) It is incremented each time the tape is accessed.	var(*LIST).ACCESS-COUNT	S	<integer 0..99999999>
Creation date	var(*LIST).CRE-DATE	S	yyyy-mm-dd
Creation job name For HSMS request name	var(*LIST).CRE-JOB-NAME	S	” <name 1..8>
Creation time	var(*LIST).CRE-TIME	S	hh:mm:ss
Device type	var(*LIST).DEV-TYPE	S	<structured-name 1..8>
Name of a directory (with catalog ID and user ID) which contains the tape.	var(*LIST).DIR-NAME	S	<filename 1..54 >
Displays whether the tape contains the directory which was also saved	var(*LIST).DIR-ON-VOL	S	*NO *YES
Status (exported or not)	var(*LIST).EXPORTED	S	*NO *YES
First archive number of the MF/MV set	var(*LIST).FIRST-VOL	S	<vsn>
File name of a tape file Without catalog ID and user ID	var(*LIST).F-NAME	S	<filename 1..41>
Expiration date of the tape Specifies when the reservation of the tape for a user ID can be terminated.	var(*LIST).FREE-DATE	S	yyyy-mm-dd
Release location A tape is moved to this location during the clear-up run.	var(*LIST).FREE-LOCATION	S	<alphanum-name 1..8>
Name of the free tape pool in which this tape is located, or in which it should be located when it is shared.	var(*LIST).FREE-POOL	S	*NO
File sequence number (4-digit)	var(*LIST).F-SEQ	S	<integer 1..9999>
Standard location	var(*LIST).HOME-LOCATION	S	<alphanum-name 1..8>
Name of the system with last access	var(*LIST).LAST-ACCESS-HOSTNAM	S	<alphanum-name 1..8>
Date of the last access	var(*LIST).LAST-ACCESS-DATE	S	yyyy-mm-dd
User ID of the last access	var(*LIST).LAST-ACCESS-USER-ID	S	<name 1..8>
Password for access	var(*LIST).PASS	S	*NONE *YES

(part 1 of 2)

Output information	Name of the S variable	T	Contents
Remark field	var(*LIST).REMARK	S	<c-string 1..24>
Reservation counter (4-digit) This counter is incremented with each new reservation of the tape.	var(*LIST).RESERV-COUNT	S	<integer 0..9999>
Reservation date Date on which a tape is reserved.	var(*LIST).RESERV-DATE	S	yyyy-mm-dd
SAVE-FILE-ID (HSMS) or SAVE-VERSION (ARCHIVE)	var(*LIST).SFID	S	<c-string 1..15>
Number of subtask for parallel save run in HSMS	var(*LIST).SUBSAVE	S	<integer0..15>
Number of subsequent tape within a parallel save run in HSMS	var(*LIST).SUBSEQ	S	<integer0..999>
Shareability of the tape	var(*LIST).USER-ACCESS	S	OWNER-ONLY FOREIGN-READ ALL-USERS
Account number	var(*LIST).USER-ACCOUNT	S	<alphanum-name 1..8>
User field. Data such as name and department or data relevant for operations scheduling can be entered here.	var(*LIST).USER-FIELD	S	<c-string 1..54>
User ID of the owner	var(*LIST).USER-ID	S	<name 1..8>
Tape VSN	var(*LIST).VOL	S	<vsn>
Volume group	var(*LIST).VOL-GROUP	S	<text 1..32>
Volume sequence number (4-digit)	var(*LIST).VOL-SEQ	S	<integer 1..255>
Tape status F = FREE P = PRIVATE R = RESERVED D = DEFECT	var(*LIST).VOL-STA-1	S	F/P/R/D

(part 2 of 2)

RETURN-TO-PROGRAM
Return to the loaded program

Privilege ADA, DA, administrator without domains

This statement terminates a MARENADM subroutine and returns you to the calling user program. It can be executed only if MAREN was called as an interactive subroutine (see section “Interactive subroutine” on page 474).

Format

RETURN-**TO-PROG**RAM

The RETURN-TO-PROGRAM statement has no operands.

RETURN-VOLUMES
Move tapes to their permanent location

Privilege ADA, DA, administrator without domains

This statement can be used by the MAREN administrator to carry out so-called “clear-up” work. The statement generates transport messages MAR4164 (relocation requests).

Tapes which are currently to be found at a TEMPORARY-LOCATION which differs from their permanent location (HOME-LOCATION) are cleared up.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

RETURN-**VOL**UMES Alias: **RTV**

VOLUME = ***ALL** / ***INT**ERVAL(...) / ***BY-FI**LE(...) / <vsn> /
*__BY-DIR__ECTORY(...) / list-poss(10): <vsn> / ***BY-VOL**UME-**GR**OUP(...)

***INT**ERVAL(...)
FROM = ***FIRST** / <vsn>
,**TO** = ***LAST** / <vsn>
,**FROM-FSEQ** = **1** / <integer 1..9999>

***BY-FI**LE(...)
FILE-**NAME** = <filename 1..41 without-cat-user>
,**VERSION** = ***LATEST** / <integer -9999..0> / ***ALL**
,**USER-ID**ENTIFICATION = ***ALL** / <name 1..8>
,**TYPE-OF-VOL**UMES = ***VALID** / ***OBSOLETE** / ***ANY**

***BY-DIR**ECTORY(...)
DIRECTORY-**NAME** = <filename 1..54 without-gen-vers>
,**SAVE-FI**LE-**ID** = ***LATEST** / <integer -32767..0> / <composed-name 15..15>

***BY-VOL**UME-**GR**OUP(...)
VOLUME-**GR**OUP = <text 1..32 without-sep>

(part 1 of 2)

,**DOMAIN** = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

,**EXCEPTIONS** = ***NO** / ***MARENUCP-USAGE**

,**FROM-LOC**ATION = ***ALL** / <alphanum-name 1..8>

,**TO-LOC**ATION = **CENTRAL** / ***ALL** / <alphanum-name 1..8>

,**MESS**AGE-**DEST**INATION = ***SYSOUT** / list-poss(5): ***SYSOUT** / ***SYSLST** / ***CONSOLE** / ***PRINTER** / ***FI**LE

,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

(part 2 of 2)

Operands

VOLUME =
Archive numbers of tapes to be relocated to their permanent location.

VOLUME = *ALL
All tapes are processed.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

VOLUME = *BY-FILE(...)
All tapes belonging to a file or a tape set are to be relocated.

FILE-NAME = <filename 1..41 without-cat-user>
Specifies the file name for which a tape set is to be cleared up.

VERSION =
This operand can be used to select a specific version (or status) of the specified file.

VERSION = *LATEST
Selects the latest version of the file (i.e. the last one created).

VERSION = <integer -9999..0>
Specifying 0 is equivalent to specifying *LATEST, specifying -1 indicates the penultimate file status, etc.

VERSION = *ALL
Selects all versions which exist for the specified file name.

USER-IDENTIFICATION =
This operand selects the user ID to which the tapes are assigned (archive entry field USER-ID).

USER-IDENTIFICATION = *ALL
The user IDs are not evaluated during selection.

USER-IDENTIFICATION = <name 1..8>
Only those archive numbers which are assigned to the specified user ID are selected.

TYPE-OF-VOLUMES =
This operand selects the volume sequences (catalog entry field VOLUME-SEQUENCE) within a tape set. These numbers are usually unique. Some numbers may be duplicated following a restart.

TYPE-OF-VOLUMES = *VALID
If a volume sequence occurs more than once in a tape set, the one created most recently is selected.

TYPE-OF-VOLUMES = *OBSOLETE
If tape sequence numbers occur more than once for a tape set, all are selected except the one most recently created.

TYPE-OF-VOLUMES = *ANY
The volume sequences for a tape set are not checked to establish whether they occur more than once.

VOLUME = *BY-DIRECTORY(...)
All tapes listed (as saved files) in the specified directory are to be swapped back in again.

DIRECTORY-NAME = <filename 1..54 without-gen-vers>
Name of the directory. Only reserved tapes assigned to the Pool of the specified directory are selected.
If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

SAVE-FILE-ID =
The tapes that are to be moved are selected via the save file of the ARCHIVE directory specified.

SAVE-FILE-ID = *LATEST
All tapes listed in the last, i.e. most recent save file are selected.

SAVE-FILE-ID = <integer -32767..0>
All tapes listed in the nth save file are selected (the older the save file, the larger the number n). 0 equals *LATEST. Example: if -5 is specified, the tapes are selected from the last save file but five.

SAVE-FILE-ID = <composed-name 15..15>
All tapes in the save file with the specified SAVE-FILE-ID are selected. The SAVE-FILE-ID has the following format: `S.yymmdd.hhmmss`.

VOLUME = <vsn>
Archive number.

VOLUME = *BY-VOLUME-GROUP(...)
All tapes of the specified volume group are returned.

VOLUME-GROUP = <text 1..32 without-sep>
Name of the volume group. “*” can be entered as the last character. In this case all volume groups which begin with the specified string are selected.

DOMAIN =
The tapes of the selected domain are relocated.

DOMAIN = *ANY
The tapes of the all domains are relocated.

DOMAIN = *OWN
The tapes of the user's own domain are relocated.
The user's own domain is the domain of the system on which the ADA is currently working or the domain in which he/she has taken over the DA role.

DOMAIN = *STD-DOMAIN
The tapes of the standard domain are relocated.

DOMAIN = <alphanum-name 1..8>
The tapes of the specified domain are relocated.

EXCEPTIONS =
This operand can be used to exclude specific tapes from the clear-up run.

EXCEPTIONS = *NO
There are no exceptions.

EXCEPTIONS = *MARENUCP-USAGE
Tapes provided for MARENUCP by means of the SECURE-FREE-VOLUMES statement are not cleared up.

FROM-LOCATION = *ALL / <alphanum-name 1..8>
Location name or symbolic location name. Specifies the location from which the tapes are to be relocated.

TO-LOCATION =
Location name or symbolic location name. Specifies the location to which tapes are to be relocated.

TO-LOCATION = CENTRAL
The tapes are relocated to the central archive only.

TO-LOCATION = *ALL
The tapes are relocated to all locations.

TO-LOCATION = <alphanum-name 1..8>
The location of an archive system can also be specified. Tapes that are relocated to an archive system are initially assigned the temporary location "CENTRAL". Only when the tape is actually inserted in the archive system is TEMPORARY-LOCATION assigned the location name of the archive system. The value from the archive catalog field TEMPORARY-LOCATION is also used as an insert for FROM-LOCATION in transport message `MAR4164`, while the value for HOME-LOCATION is also used for TO-LOCATION.

Thus, a tape which is currently at the location "CENTRAL" is not interpreted as "cleared up". In this case, the transport message `MAR4164` (from "CENTRAL" to "archive system location") is output.

MESSAGE-DESTINATION = *SYSOUT / list-poss(5): *SYSOUT / *SYSLST / *CONSOLE / *PRINTER / *FILE
Specifies the medium on which transport message MAR4164 is to be output. See notes below.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- If the FILE-NAME operand is specified and one of the selected catalog entries has the attribute FILE-SEQ > 1, processing aborts and an appropriate error message is displayed.
- Tapes which have been exported or are currently reserved are not cleared up.
- Tapes which are located at an archive system location defined as REMOTE on the local syastem are not cleared up.
- If there are no tape to be cleared up, task switch 30 is set.
- Tapes relocated to an archive system location are initially assigned the temporary location “CENTRAL”.
- If HOME-LOCATION contains an archive system, TEMPORARY-LOCATION is set to “CENTRAL”.
- If MESSAGE-DESTINATION=*PRINTER or =*FILE is specified, all transport messages are written to the file MAREN.RETURN-VOLUMES. If the file already exists, it is extended, otherwise, it is created.
- If MESSAGE-DESTINATION=*PRINTER is specified, the file MAREN.RETURN-VOLUMES is printed and deleted after the last archive number has been processed. Output is directed to the printer specified in the MAREN parameter EXPORT-RECEIPT= *PRINTER (DEVICE-NAME=...). If the statement aborts, the file is not printed. The statement can then be re-entered, the file is updated, and in the event of normal termination, the file containing all the transport messages generated is printed.
- If MESSAGE-DESTINATION=*PRINTER is specified and the MAREN parameter EXPORT-RECEIPT contains a value other than PRINTER, the statement is rejected with the message MARM175.

- The TEMPORARY-LOCATION catalog entry field is set to the value of HOME-LOCATION in the catalog entry.
- Any release run should as a rule take place before the clear up run so that tapes which have been released can be immediately relocated to their location for free tapes (FREE-LOC).
- In the event of an individual, list, or number range specification, the entire inventory is searched.
- In the event of an individual or list specification, the spin off is triggered in the following cases:
  - The tape has been exported or reserved, does not exist, or is already at its permanent location
  - The TO-LOCATION specified is different to the HOME-LOCATION of the tape
- If the tapes are selected using a save file from HSMS and at least one tape is temporarily locked, the statement is not executed.

Example

```
//return-vol vol=*int(id0001,id1200),mess-dest=(*sysout,*syslst)
%  MAR4164 PLEASE TRANSPORT VOLUME 'ID0001' FROM 'MANUAL' TO 'CENTRAL'
%  MAR4164 PLEASE TRANSPORT VOLUME 'ID0002' FROM 'MANUAL' TO 'CENTRAL'
%  MAR4164 PLEASE TRANSPORT VOLUME 'ID0003' FROM 'MANUAL' TO 'CENTRAL'
%  MAR4164 PLEASE TRANSPORT VOLUME 'ID0004' FROM 'MANUAL' TO 'CENTRAL'
%  MAR4164 PLEASE TRANSPORT VOLUME 'ID0005' FROM 'MANUAL' TO 'CENTRAL'
%  MAR4164 PLEASE TRANSPORT VOLUME 'ID0006' FROM 'MANUAL' TO 'CENTRAL'
%  MARM120 TOTAL OF 6 MAREN CATALOG ENTRIES PROCESSED
```

All tapes from the set of VSNs id0001 to id1200 which are assigned to the permanent location CENTRAL (TO-LOCATION=CENTRAL is the default) but which are currently at another location (FROM-LOCATION=*ALL is the default) are relocated to their permanent location CENTRAL. The transport messages are output to SYSOUT and SYSLST.

SECURE-FREE-VOLUMES
Flag and relocate free tapes

Privilege ADA, DA, administrator without domains

This statement has two functions:

- Identification of free tapes with respect to the type of reservation.
- Outputting transport messages `MAR4164` (relocation requests)

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

SECURE-**FREE-VOL**UMES Alias: **SCFV**

NUMBER-OF-VOLUMES = <integer 1..9999>

,**TO-LOC**ATION = <alphanum-name 1..8>

,**FROM-LOC**ATION = **CENTRAL** / <alphanum-name 1..8>

,**VOL**UME = ***ALL** / ***INT**ERVAL(...)

***INT**ERVAL(...)
- **FROM** = ***FIRST** / <vsn>
- ,**TO** = ***LAST** / <vsn>
- ,**FROM-FSEQ** = **1** / <integer 1..9999>

,**DEV**ICE-**TYPE** = ***STD** / <structured-name 1..8>

,**USAGE** = ***ANY** / ***BY-MARENUCP**

,**FREE-POOL** = ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> / <text 2..32 without-sep>

,**DOMAIN** = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

,**MESS**AGE-**DEST**INATION = ***SYSOUT** / list-poss(5): ***SYSOUT** / ***SYSLST** / ***CONSOLE** / ***PRINTER** / ***FI**LE

,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

Operands

NUMBER-OF-VOLUMES = <integer 1..9999>
Number of free tapes to be processed.

TO-LOCATION = <alphanum-name 1..8>
Location name or symbolic location name to which free tapes are to be relocated. This may be identical to FROM-LOCATION, in which case the tapes are merely flagged.

FROM-LOCATION = CENTRAL / <alphanum-name 1..8>
Location from which free tapes are to be selected.

VOLUME =
Range of archive numbers from which free tapes are to be processed.

VOLUME = *ALL
All free tapes are processed.

VOLUME = *INTERVAL(...)
All free tapes whose archive number is within the specified range are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
The tapes are of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified with the MODIFY-MAREN-PARAMETERS statement.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

USAGE =
Specifies the possible reservation type for the tapes selected. Reservation is effected either explicitly via the RESERVE-FREE-VOLUME statement or implicitly via the automatic free tape allocation facility MARENUCP.

USAGE = *ANY
Both types of reservation are permitted for the free tapes selected.

USAGE = *BY-MARENUCP
The tapes are to be reserved via MARENUCP only.

FREE-POOL =
Selects the catalog entries to be made available on the basis of the free tape pool.

FREE-POOL = *NO
Only free tapes assigned to the *NO free tape pool are selected.

FREE-POOL = *GLOBAL
Only free tapes assigned to the *GLOBAL free tape pool are selected.

FREE-POOL = *TSOS
Only free tapes assigned to the *TSOS free tape pool are selected.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
Only free tapes assigned to the free tape pool for HSMS/ARCHIVE applications using the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other.

DOMAIN =
Only those tapes are processed which are assigned to the specified domain.

DOMAIN = *STD-DOMAIN
Only tapes of the standard domain are processed.

DOMAIN = *OWN
Only tapes of the user's own domain are processed.
The user's own domain is the domain of the system on which the ADA is currently working or the domain in which he/she has taken over the DA role.

DOMAIN = <alphanum-name 1..8>
Only tapes of the selected domain are processed.

If domains are used, the DA is shown free tapes either from the standard domain or from his/her own domain. This is dependent on which value the domain-specific FREE-VOLUMES operand has.
The ADA is shown free tapes of the domain which is specified with the DOMAIN operand.

MESSAGE-DESTINATION = *SYSOUT / list-poss(5): *SYSOUT / *SYSLST / *CONSOLE / *PRINTER / *FILE
Specifies the medium on which the transport messages `MAR4164` are to be output. See notes below.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- Only free tapes (VOLUME-STATUS=*FREE) whose TEMPORARY-LOCATION is the same as the specified FROM-LOCATION are relocated.
- If MESSAGE-DESTINATION=*PRINTER/*FILE is specified, all transport messages are written to the file `$<userid>.MAREN.SECURE-FREE-VOLUMES`, where `userid` is the user ID of the calling task. If the file already exists, it is extended, otherwise, it is created.
- If MESSAGE-DESTINATION=*PRINTER is specified, the file MAREN.SECURE-FREE-VOLUMES is printed and deleted after the last VSN has been processed using the SPOOL macro PRNT. Output is directed to the printer specified in the MAREN parameter EXPORT-RECEIPT = *PRINTER(DEVICE-NAME=...). If the statement aborts, the file is not printed.
  The statement can then be restarted, the file is updated, and in the event of normal termination, the file containing all the transport messages generated is printed.
- If MESSAGE-DESTINATION=*PRINTER is specified and the MAREN parameter EXPORT-RECEIPT contains a value other than PRINTER, the statement is rejected with the message `MARM175`.
- The selected free tapes are always flagged in accordance with the USAGE operand, independent of any previously existing flags.
- The operand USAGE=*BY-MARENUCP is also recommended for the SECURE-FREE-VOLUMES statement with a directory specification. Although tapes pre-reserved for ARCHIVE cannot be reserved using the MAREN statement RESERVE-FREE-VOLUME, they can be reserved by means of the ARCHIVE statement POOL ...,ADD=vsn.
- Archive system locations must not be used for the FROM-LOCATION and TO-LOCATION operands. The only exception here is if the same archive system location is specified for both operands, in which case no tapes are relocated.
- Device type TAPE-UxE is not permissible for this statement as free tapes are not encrypted.

Examples

```
//secure-free-volumes number-of-vol=5,to-loc=system3,vol=*int(FR0000)
%  MARM169 VOLUME 'FR0000' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM3'
%  MAR4164 PLEASE TRANSPORT VOLUME 'FR0000' FROM 'CENTRAL' TO 'SYSTEM3'
%  MARM169 VOLUME 'FR0001' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM3'
%  MAR4164 PLEASE TRANSPORT VOLUME 'FR0001' FROM 'CENTRAL' TO 'SYSTEM3'
%  MARM169 VOLUME 'FR0008' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM3'
%  MAR4164 PLEASE TRANSPORT VOLUME 'FR0008' FROM 'CENTRAL' TO 'SYSTEM3'
%  MARM169 VOLUME 'FR0013' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM3'
%  MAR4164 PLEASE TRANSPORT VOLUME 'FR0013' FROM 'CENTRAL' TO 'SYSTEM3'
%  MARM169 VOLUME 'FR0019' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM3'
%  MAR4164 PLEASE TRANSPORT VOLUME 'FR0019' FROM 'CENTRAL' TO 'SYSTEM3'
%  MARM120 TOTAL OF 5 MAREN CATALOG ENTRIES PROCESSED
```

Five free tapes starting with VSN fr0000 are relocated from CENTRAL to SYSTEM3. The transport messages appear only on SYSOUT.

```
//show-volume-attributes volume=FR0000
VOLUME    = FR0000       FILE-SEQ      = 0001          DEV-TYPE =  TAPE-C4

USER-ID   =              HOME-LOCATION = CENTRAL       RESERV-DATE =
ACCOUNT   =              FREE-LOCATION = CENTRAL       FREE-DATE   =
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = SYSTEM3       EXPIR-DATE  =
PASSWORD  = NONE
EXPORT    = C'                                                  '  /
REMARK /1 = C'                         ' /2 = C'          ' /3 = C'      '
USER-FIELD= C'                                                      '
FILE-NAME =
SAVE-FILE =                  SUBSAVE/SEQ =   /    CR-JOB/REQUEST-NA  =
FREE-POOL = *NO                                   CR-CAT-ID          =
VOL-GROUP =                                       CR-USER-ID         =
VOL-SEQ   = 0001       CR-DATE      =             LAST-ACC-DATE      =
FIRST-VOL =            CR-TIME      =             LAST-ACC-TIME      =
CLOSE-IND =            LAST-CL-DATE =             LAST-ACC-USER-ID   =
VOL-STATUS= FREE       LAST-CL-TIME =             LAST-ACC-ACCOUNT   =
INIT      = NO         REG-DATE     =             LAST-ACC-JOB-NAME  =
ADM-FIELD = C'        ' /2 = C'                ' LAST-ACC-TSN       =
                                                  LAST-ACC-HOSTNAME  =
                                                  LAST-WRITE-BLK-CNT =
```

This statement shows the result.

```
//sec-free-vol num-of-vol=10,to-loc=system4,from-loc=system1,
   mess-dest=*console
%  MARM169 VOLUME 'FR1000' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM4'
(MSG) %  %  MAR4164 PLEASE TRANSPORT VOLUME 'FR1000' FROM 'SYSTEM1' TO
'SYSTEM4'
%  MARM169 VOLUME 'FR1001' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM4'
(MSG) %  %  MAR4164 PLEASE TRANSPORT VOLUME 'FR1001' FROM 'SYSTEM1' TO
'SYSTEM4'
...
%  MARM169 VOLUME 'FR1009' AVAILABLE FOR RESERVATIONS AT LOCATION 'SYSTEM4'
(MSG) %  %  MAR4164 PLEASE TRANSPORT VOLUME 'FR1009' FROM 'SYSTEM1' TO
'SYSTEM4'
%  MARM120 TOTAL OF 10 MAREN CATALOG ENTRIES PROCESSED
```

Ten free tapes on SYSTEM1 are relocated to SYSTEM4. The transport messages are output on the console (messages begin with `(MSG) %`).

```
//sec-free-vol num-of-vol=4,to=system4,from=system4,usage=*by-marenucp
%  MARM168 VOLUME 'FR1000' SECURED FOR MARENUCP AT LOCATION 'SYSTEM4'
%  MARM168 VOLUME 'FR1001' SECURED FOR MARENUCP AT LOCATION 'SYSTEM4'
%  MARM168 VOLUME 'FR1002' SECURED FOR MARENUCP AT LOCATION 'SYSTEM4'
%  MARM168 VOLUME 'FR1003' SECURED FOR MARENUCP AT LOCATION 'SYSTEM4'
%  MARM120 TOTAL OF 4 MAREN CATALOG ENTRIES PROCESSED
```

Four free tapes already located on SYSTEM4 are flagged for automatic free tape allocation using MARENUCP, i.e. these four tapes cannot be reserved using RESERVE-FREE-VOLUMES.

SHOW-ADMINISTRATION-SCOPE
Show administered domains

Privilege ADA, DA

This statement displays whether all or just one (and if required which) domain(s) is/are currently being administered. The system whose system-specified parameters are valid for the subsequent statements is also shown.

Format

SHOW-ADMINISTRATION-SCOPE	Alias: **SHAS**

The SHOW-ADMINISTRATION-SCOPE statement has no operands.

Example

```
//show-administration-scope

ADMINISTRATION-SCOPE = *ALL-DOM
HOST                 = SYSTEM1
```

SHOW-DOMAIN-PARAMETERS
Show domain-specific parameters

Privilege ADA, DA

This statement displays the domain-specific parameters of a domain and all systems which are assigned to this domain.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

SHOW-DOMAIN-PARAMETERS	Alias: **SHDP**
DOMAIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>	

Operands

DOMAIN =
The parameters of the specified domain are output.

DOMAIN = *STD-DOMAIN
The parameters of the standard domain are output.

DOMAIN = *OWN
The parameters of the standard domain from the user's own domain are output.
The user's own domain is the domain of the system on which the ADA is currently working or the domain in which he/she has taken over the DA role.

DOMAIN = <alphanum-name1..8>
The parameters of the standard domain from the selected domain are output.

Example

```
//show-domain-parameters  domain = domain1

DOMAIN             = DOMAIN1
FREE-VOLUMES       = *FROM-STD-DOMAIN

HOSTS              = SYSTEM1
                     SYSTEM2
```

SHOW-FOREIGN-DEVICE-TYPES
Show foreign device types

Privilege ADA, administrator without domains

Format

SHOW-FOREIGN-DEVICE**-TYPES**	Alias: **SHFDT**

The SHOW-FOREIGN-DEVICE-TYPES statement has no operands.

Example

```
//show-foreign-device-types
------------------------------------------------------------------------------
FOREIGN-DEVICE-TYPE         INTERNAL-DEVICE-TYPE
------------------------------------------------------------------------------
     FLOPPY                  X'0001'
     DVD                     X'0002'
     DVD-RW                  X'0003'
     CD-ROM                  X'0004'
     CD-RW-UX                X'0005'
     UNIX-DEV                X'0006'
     PC-DEV                  X'0007'
     WORK-DEV                X'0008'
     SOLARIS                 X'0009'
     STREAMER                X'000A'
```

`INTERNAL-DEVICE-TYPE` displays the encryption of the device type as stored in the catalog entry.

SHOW-FREE-VOLUMES
Show information about free tapes

Privilege ADA, DA, administrator without domains

This statement outputs information on free tapes to SYSOUT. The catalog entries of the free tapes can be written to an output file. The file can also be created in CSV format to permit spreadsheet processing. An output file can be sent by email.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

SHOW-FREE-VOLUMES Alias: **SHFV**

VOLUME = ***ALL** / ***INT**ERVAL(...)

***INT**ERVAL(...)
| **FROM** = ***FIRST** / <vsn>
| ,**TO** = ***LAST** / <vsn>
| ,**FROM-FSEQ** = **1** / <integer 1..9999>

,**FREE-LOC**ATION = ***ALL** / <alphanum-name 1..8>

,**DEV**ICE**-TYPE** = ***STD** / ***ALL-TAPES** / <structured-name 1..8>

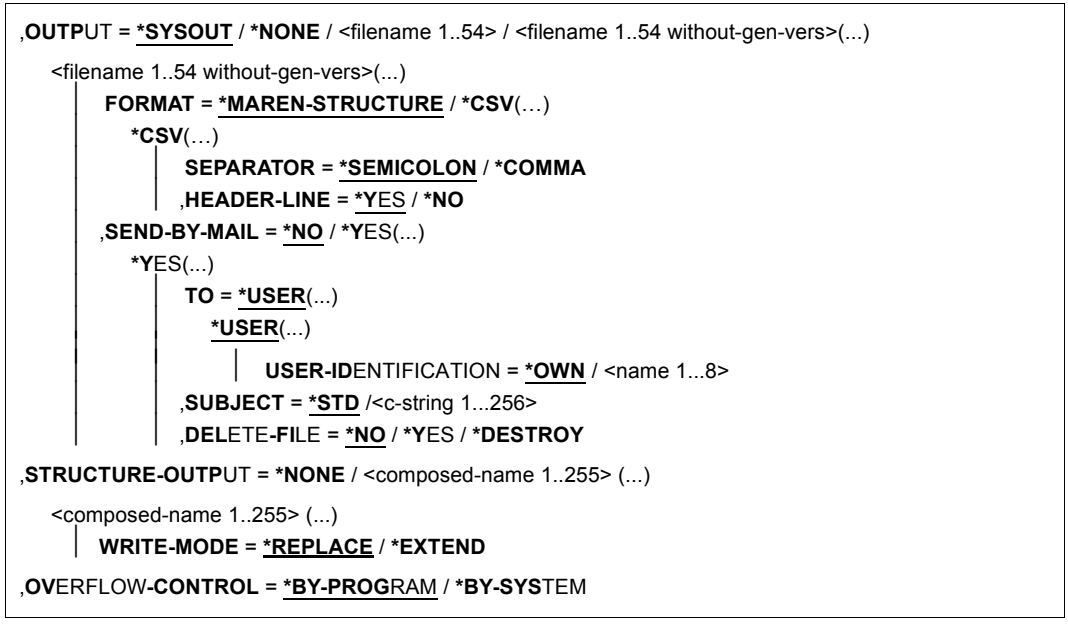
,**USAGE** = ***ANY** / ***BY-MARENUCP**

,**FREE-POOL** = ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> / <text 2..32 without-sep>

,**DOMAIN** = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

,**SORT-MODE** = ***VOL**UME / ***RES**ERVATION**-COUNT** / ***LAST-ACCESS-DATE** / ***FREE-DATE**

(part 1 of 2)



(part 2 of 2)

Operands

VOLUME =
Archive numbers of tapes about which information is required.

VOLUME = *ALL
All tapes are processed.

VOLUME = *INTERVAL(...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the program interface.

FREE-LOCATION = *ALL / <alphanum-name 1..8>
Location name or symbolic location name. All catalog entries with the specified location for free tapes are processed.

FREE-LOCATION = *ALL
All locations for free tapes are processed.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *STD
All tapes of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified in the MODIFY-MAREN-PARAMETERS statement are listed.

DEVICE-TYPE = *ALL-TAPES
All tapes are displayed (see notes on page 407).

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

USAGE =
Specifies whether, on output of the catalog entries, a selection is to be made on the basis of the reservation type of free tapes. Reservation is effected either explicitly via the RESERVE-FREE-VOLUME statement or implicitly via the automatic free tape allocation facility MARENUCP.

USAGE = *ANY
The catalog entries of all free tapes are to be output, regardless of their reservation type.

USAGE = *BY-MARENUCP
The catalog entries of free tapes which can only be reserved via the automatic free tape allocation facility (MARENUCP) are to be output.

FREE-POOL =
Selects the catalog entries to be made available on the basis of the free tape pool.

FREE-POOL = *NO
Only free tapes assigned to the *NO free tape pool are selected.

FREE-POOL = *GLOBAL
Only free tapes assigned to the *GLOBAL free tape pool are selected.

FREE-POOL = *TSOS
Only free tapes assigned to the *TSOS free tape pool are selected.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
Only free tapes assigned to the free tape pool for HSMS/ARCHIVE applications using the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other. “*” can be entered as the last character. In this case all catalog entries in all free tape pools will be listed, which begin with the specified character string. The sort criteria will apply only within the individual free tape pools.

DOMAIN =
Specifies the domain whose free tapes are shown.

DOMAIN = *ANY
Free tapes of all domains are shown.

DOMAIN = *OWN
Free tapes of the user’s own domain are shown.
The user’s own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
Free tapes of the standard domain are shown.

DOMAIN = <alphanum-name 1..8>
Specifies the domain whose free tapes are shown.

If domains are used, the DA is shown free tapes either from the standard domain or from his/her own domain. This is dependent on which value the domain-specific FREE-VOLUMES operand has.
The ADA is shown free tapes of the domain which is specified with the DOMAIN operand.

SORT-MODE =
Specifies the catalog entry field by which output should be sorted.

SORT-MODE = *VOLUME
The catalog entries are sorted according to archive numbers.

SORT-MODE = *RESERVATION-COUNT
The catalog entries are sorted according to the reservation counter.

SORT-MODE = *LAST-ACCESS-DATE
The catalog entries are sorted according to the date of the last access.

SORT-MODE = *FREE-DATE
The catalog entries are sorted according to the date of the last release.

OUTPUT =
Determines the output medium. Output to SYSOUT is the default.

OUTPUT = *SYSOUT
Output is directed to SYSOUT.

OUTPUT = *NONE
No output takes place. This specification only makes sense for structured output in an S variable (see the STRUCTURE-OUTPUT operand).

OUTPUT = <filename 1..54>
Only for specifying a file generation.
Output is directed to the specified file generation in MAREN format. Passwords are overwritten with C'$$$$'. Only the number of records written is displayed on SYSOUT.

OUTPUT = <filename 1..54 without-gen-vers>(...)
Name of the SAM output file to which all selected catalog entries are to be written. Passwords are overwritten with C'$$$$'. Only the number of records written is displayed on SYSOUT. The output format and transfer by email can also be specified.

FORMAT =
Determines the format of the output file.

FORMAT = *MAREN-STRUCTURE
Output takes place in MAREN format.

FORMAT = *CSV(…)
Output takes place in CSV (comma separated value) format. Files in CSV format can be read in so that the columns are retained, and they can be processed further with a spreadsheet program (e.g. EXCEL).

SEPARATOR = *SEMICOLON / *COMMA
Determines the separator which is to be set between the various output values. The default separator is a semicolon (;). Optionally a comma (,) can be used as the separator.

HEADER-LINE = *YES / *NO
Specifies whether a header line should be output to name the output columns. The default is *YES, i.e. the header line is output. The header line contains the names of the catalog entry fields.

SEND-BY-MAIL = *NO / *YES(...)
Specifies whether the output file should be sent by email. The default is *NO, i.e. it is not sent by email. Transfer by email takes place only if the file to be sent contains at least one entry.

SEND-BY-MAIL = *YES(...)
The output file should be sent as an email attachment. The recipient is addressed by means of his/her user ID, i.e. the email address is taken from the user entry concerned.

TO = *USER(...)
Details of transfer by email:

USER-IDENTIFICATION = *OWN / <name 1...8>
Specifies the user ID. The recipient's email address is taken over from this user entry. If the user entry contains more than one email address, all the addresses are taken over as recipients.
The default is *OWN, i.e. the caller's user ID.

SUBJECT = *STD /<c-string 1...256>
Determines the content of the email's "Subject" field.
The default is *STD, i.e. MAREN uses a standard text, such as MARENADM STATEMENT SHOW-FREE-VOLUMES, FILENAME: <filename>.

DELETE-FILE = *NO / *YES / *DESTROY
Specifies whether the file should be automatically deleted after it has been sent.
The default is *NO, i.e. the file is not deleted.
*YES causes the file to be deleted after it has been sent. *DESTROY also causes it to be deleted, and the memory space is overwritten with binary zeros.

STRUCTURE-OUTPUT =
Controls the structured output in S variables.

STRUCTURE-OUTPUT = *NONE
No structured output takes place.

STRUCTURE-OUTPUT = <composed-name 1..255> (...)
Name of the S variable to be used for the structured output.

WRITE-MODE =
Determines whether the output should replace or extend the current content of the S variables.

WRITE-MODE = *REPLACE
The current content of the S variable is replaced by the new output.

WRITE-MODE = *EXTEND
The new output extends the current content of the S variable.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- If a sort criterion other than *VOLUME is chosen (e.g. SORT-MODE=*FREE-DATE), the value *STD is used instead of *ALL-TAPES for the DEVICE-TYPE operand for further processing. As a result, not all tapes are displayed, but just all tapes of the default device type, which makes sense.
- Depending on how many tapes there are in the specified number range, the output of catalog entries may be very time-consuming. This is particularly true if a sort criterion other than *VOLUME is selected. It is therefore advisable to use a batch process for output or to access the MAREN catalog directly (run the program under the catalog ID or user ID TSOS).
- The spin off mechanism is triggered if the specified location for free tapes is incorrect or if no free tape has been found in the specified range.
- Device type TAPE-UxE is not permissible for this statement as free tapes are not encrypted.

Examples

```
//show-free-volumes
```

The catalog entries of all free tapes with the specified default device type are output. After every eighteen entries, the user is asked whether listing should be terminated or continued.

```
//show-free-volumes volume=*interval(from=id0,to=id9),output=list.freevol.2
%  MARM119 FILE 'LIST.FREEVOL.2' WITH 30 RECORDS CREATED
```

All free tapes with the default device type whose archive numbers lie within the range id0 to id9 are listed. Output is directed to the file list.freevol.2.

```
//show-free-volumes volume=*all
-------------------------------------------------------------------------------
VOLUME DEV-T FREE-LOC U RESC L-A-HOST L-A-DATE   FREE-DATE L-A-USER ADM-FIELD
-------------------------------------------------------------------------------
TST005 T-C4  ROBABBA1   0055 D241ZE15 <date>     <date>    TSOS
TST013 T-C4  ROBABBA1   0056 D241ZE15 <date>     <date>    TSOS
TST017 T-C4  ROBABBA1   0054 D241ZE15 <date>     <date>    USER1
TST019 T-C4  ROBABBA1   0222 D241ZE14 <date>     <date>    TSOS       352235
TST021 T-C4  ROBABBA1   0047 D241ZE15 <date>     <date>    TEST08
TST024 T-C4  ROBABBA1   0187 D241ZE14 <date>     <date>    SYSMAREN
TST026 T-C4  ROBABBA1   0061 D241ZE15 <date>     <date>    TSOS
%  MARM120 TOTAL OF 8 MAREN CATALOG ENTRIES PROCESSED
```

The catalog entries of all free tapes (default device type) assigned to a free tape pool for HSMS/ARCHIVE applications under any user ID are output.

Meaning of the catalog entry fields:

VOLUME	VSN
DEV-TYPE	Device type
FREE-LOC	Location for free tapes
U	USAGE reservation flag U indicates that reservation is possible only via MARENUCP.
RESC	Reservation counter
L-A-HOST	Name of the system with last access
L-A-DATE	Date of the last access
FREE-DATE	Expiration date
L-A-USER	User ID of the last access
ADM-FIELD	Remark field

```
//show-free-volumes volume=*int(from=id0,to=id1)
------------------------------------------------------------------------------
VOLUME DEV-T FREE-LOC U RESC L-A-HOST L-A-DATE   FREE-DATE L-A-USER ADM-FIELD
------------------------------------------------------------------------------
ID0002 T-C4  CENTRAL    0001                     <date>
ID0005 T-C4  CENTRAL    0000                     <date>
ID0006 T-C4  CENTRAL    0000                     <date>
ID0007 T-C4  CENTRAL    0000                     <date>
ID0008 T-C4  CENTRAL    0000                     <date>
ID0010 T-C4  CENTRAL    0000                     <date>
ID0011 T-C4  CENTRAL    0000                     <date>
ID0013 T-C4  CENTRAL    0000                     <date>
%  MARM120 TOTAL OF 8 MAREN CATALOG ENTRIES PROCESSED
```

All free tapes with the default device type whose archive numbers lie within the range id0 to id1 are listed.

Output in S variables

This statement supports the structured output in S variables (controlled by the STRUCTURE-OUTPUT operand).

Further information on S variables is provided in the “Commands” manual [5].

Output information	Name of the S variable	T	Contents
Access counter (8-digit) It is incremented each time the tape is accessed.	var(*LIST).ACCESS-COUNT	S	<integer 0..99999999>
Creation date	var(*LIST).CRE-DATE	S	yyyy-mm-dd
Creation job name For HSMS request name	var(*LIST).CRE-JOB-NAME	S	” <name 1..8>
Creation time	var(*LIST).CRE-TIME	S	hh:mm:ss
Device type	var(*LIST).DEV-TYPE	S	<structured-name 1..8>
Name of a directory (with catalog ID and user ID) which contains the tape.	var(*LIST).DIR-NAME	S	<filename 1..54 >
Displays whether the tape contains the directory which was also saved	var(*LIST).DIR-ON-VOL	S	*NO *YES
Status (exported or not)	var(*LIST).EXPORTED	S	*NO *YES
First archive number of the MF/MV set	var(*LIST).FIRST-VOL	S	<vsn>
File name of a tape file Without catalog ID and user ID	var(*LIST).F-NAME	S	<filename 1..41>

(part 1 of 3)

Output information	Name of the S variable	T	Contents
Expiration date of the tape Specifies when the reservation of the tape for a user ID can be terminated.	var(*LIST).FREE-DATE	S	yyyy-mm-dd
Release location A tape is moved to this location during the clear-up run.	var(*LIST).FREE-LOCATION	S	<alphanum-name 1..8>
Name of the free tape pool in which this tape is located or in which it should be located when it is shared	var(*LIST).FREE-POOL	S	<filename 1..54> *NO *GLOBAL *TSOS
File sequence number (4-digit)	var(*LIST).F-SEQ	S	<integer 1..9999>
Standard location	var(*LIST).HOME-LOCATION	S	<alphanum-name 1..8>
Name of the system with last access	var(*LIST).LAST-ACCESS-HOSTNAM	S	<alphanum-name 1..8>
Date of the last access	var(*LIST).LAST-ACCESS-DATE	S	yyyy-mm-dd
User ID of the last access	var(*LIST).LAST-ACCESS-USER-ID	S	<name 1..8>
Password for access	var(*LIST).PASS	S	*NONE *YES
Comment field which should be filled with a meaningful text.	var(*LIST).REMARK	S	<c-string 1..24>
Reservation counter This counter is incremented with each new reservation of the tape.	var(*LIST).RESERV-COUNT	S	<integer 0..9999>
Reservation date Date on which a tape is reserved.	var(*LIST).RESERV-DATE	S	yyyy-mm-dd
SAVE-FILE-ID (HSMS) or SAVE-VERSION (ARCHIVE)	var(*LIST).SFID	S	<c-string 1..15>
Number of subtask for parallel save run in HSMS	var(*LIST).SUBSAVE	S	<integer 0..15>
Number of subsequent tape within a parallel save run in HSMS	var(*LIST).SUBSEQ	S	<integer 0..999>
Shareability of the tape	var(*LIST).USER-ACCESS	S	OWNER-ONLY FOREIGN-READ ALL-USERS
Account number	var(*LIST).USER-ACCOUNT	S	<alphanum-name 1..8>
User field. Data such as name and department or data relevant for operations scheduling can be entered here.	var(*LIST).USER-FIELD	S	<c-string 1..54>
User ID of the owner	var(*LIST).USER-ID	S	<name 1..8>
Tape VSN	var(*LIST).VOL	S	<vsn>

(part 2 of 3)

Output information	Name of the S variable	T	Contents
Volume group Only has a valid value with reserved tapes, otherwise it is undefined.	var(*LIST).VOL-GROUP	S	<text 1..32>
Volume sequence number (4-digit)	var(*LIST).VOL-SEQ	S	<integer 1..255>
Tape status F = FREE P = PRIVATE R = RESERVED D = DEFECT	var(*LIST).VOL-STA-1	S	F/P/R/D

(part 3 of 3)

SHOW-GLOBAL-PARAMETERS
Show global parameters of a MAREN network

Privilege ADA, administrator without domains

Format

SHOW-GLOBAL-PARAMETERS	Alias: **SHGP**

The SHOW-GLOBAL-PARAMETERS statement has no operands.

Example

```
//show-global-parameters

DOMAIN-PROTECTION = *ACTIVE
ALL-DOMAIN-ADMINISTRATOR-PASSWORD = *NONE
ACCESS-MODE = *SHARED
```

SHOW-MAREN-FILE
Show information of a MAREN catalog file

Privilege ADA, DA, administrator without domains

Without the help of other MAREN components, this statement displays information from the MAREN catalog files.

Format

SHOW-MAREN-**FI**LE	Alias: **SHMF**
FILE-**NAME** = ***MARENCAT** / ***MARENLOG** / <filename 1..54>	

Operands

FILE-NAME =

FILE-NAME = *MARENCAT
Entries from the current MAREN catalog will be displayed.

FILE-NAME = *MARENLOG
Entries from the current MAREN log file will be displayed.

FILE-NAME = <filename 1..54>
Name of the file from which the MAREN catalog entries are to be displayed.

The following files can be read:

- Volume catalog
  The current volume catalog of MAREN and any number of copies of it can be assigned.
- Logging files
  Here, too, the current open logging file or an older logging file (perhaps compiled from a number of individual files) can be used.
- Output files
  These are files which contain full catalog entries in MAREN format, and which can be created using various MAREN and MARENADM statements.
  `//SHOW-VOLUME-ATTRIBUTES OUTPUT=<filename>`

Possible applications

Here are a selection of possible applications for SHOW-MAREN-FILE:

- Information can be retrieved from the MAREN catalog even if the MARENCP control program crashes.
- The output files generated by various statements (e.g. RESERVE-FREE-VOLUME) can be evaluated.
- The logging files make it easy to check all accesses to a tape.

The catalog entries and MAREN parameters are output in the same format as in the statements SHOW-VOLUME-ATTRIBUTES VOL=<vsn> and SHOW-MAREN-PARAMETERS.

Once the statement has been issued, various input alternatives are offered depending on the specified file type (volume catalog, logging file, or output file).

Notes

Once a file name is entered, the associated file is checked. Various file attributes are checked to determine whether the file is a catalog file, and if so, what type it is. In the case of a volume catalog or a logging file, the file is opened in SHARED-UPDATE=YES mode to make it possible to access current catalog files.

If the file is a volume catalog, the MAREN parameters are listed (these are always in the first record in the volume catalog) and the following prompt is displayed:

```
MARM1E2 ENTER: VSN / POS(VSN) / +N / -N / ++ / -- / 'ETX' / END
```

If a logging file has been assigned, the following prompt is displayed without prior output:

```
MARM1E3 ENTER: FROM=VSN / LIST=VSN / VSN / +N / -N / ++ / -- / 'ETX' / END
```

If the file is a output file, the first catalog entry it contains is displayed. The following prompt is then output:

```
MARM1E1 ENTER: +N / -N / ++ / -- / 'ETX' / END; RECORD COUNTER = '(&OO)'
```

In the case of MAREN output files in SAM format, the RECORD COUNTER catalog entry field indicates how many records were read from the file by the last action carried out. The number of catalog entries in the output file can thus be determined easily by entering “++” (position to end of file).

The following parameters can be used with all types of input files:

Parameters	Action / notes
+n	Starting at the current position and working towards the end of the file, read the next “n” records and display the current record (n = max. 6-digit number).
-n	Starting at the current position and working towards the top of the file, read the next “n” records and display the current record (n = max. 6-digit number).
++	Display the last record in the file.
--	Display the first record in the file.
'ETX'	(Same as DUE) Working towards the end of the file, display the next record (corresponds to entering “+1”).
END	End the display. Other MARENADM statements can then be entered.

The following parameters can also be specified if the input file is a volume catalog:

Parameters	Action / note
vsn	Display the first record in the input file with the specified archive number (e.g. TAPE01).
POS(vsn)	Position to the specified VSN in the volume catalog and read the next record. The catalog entry may refer to the archive number specified or, if this does not exist, to the next highest archive number.

The following parameters can also be specified for logging files in addition to those supported by all file types:

Parameters	Action / note
vsn	Display the first logging entry for the specified archive number.
FROM=vsn	Display a brief summary of all logging entries beginning with the specified archive number. The logging entries are sorted chronologically within the individual VSN and file sequence number.
LIST=vsn	Display a brief summary of all logging entries for the specified archive number. The entries are listed in the order in which they were created.

If the display is longer than the screen length for the FROM=<vsn> and LIST=<vsn> parameters, it can be interrupted by pressing the K2 key.

If a FREE-POOL record is found while paging, the message is output instead of the output mask:

```
MARM214 FREE-POOL-NAME '(&00)', LAST ACCESS FUNCTION NAME '(&01)',
        FUNCTION NUMBER '(&02)'
```

Setting task switch 5 causes catalog entries and MAREN parameters to be listed line by line in interactive mode rather than in a single display screen. This improves the readability of entries in SYSOUT logs. In batch mode, output is on a line-by-line basis.

Outputting logging records

In the case of logging records, the catalog entry they contain is output first, followed by the logging information. The latter shows when the logging record was written and on which pubset. Example:

```
** LOGGING RECORD WRITTEN AT DATE: <date> AT TIME: <time> ON PVS: PI1B **
```

If all records relating to a particular archive number or to a number of archive numbers starting with a specific archive number are to be listed (parameter LIST=vsn or FROM=vsn), the list is limited to a few catalog entry fields. Catalog entries are not shown in full.

The following information is provided (where each line begins with the abbreviation which appears in the header):

VOLUME	-	Archive number (VOLUME)
FSEQ	-	File sequence number (FILE-SEQUENCE)
C#	-	Check number (CHECK-COUNT)
FUNCNAME	-	Function name of the last access (LAST-ACCESS-FUNCTION-NAME)
FF	-	Function flag for the last access (LAST-ACCESS-FUNCTION-FLAG)
LOG-DATE	-	Date on which the logging entry was created
LOG-TIME	-	Time at which the logging entry was created
C-ID	-	Catalog ID of the pubset on which the logging entry was written
HOSTNAME	-	Name of the system on which the tape was last processed
STA	-	Status of the tape (VOLUME-STATUS)
DV	-	Device type (DEVICE-TYPE) in internal format
MN	-	Mnemonic name of the device on which the tape was last processed (DEVICE-NAME)
TSN	-	TSN of the task which last processed the tape (LAST-ACCESS-TSN)
RES#	-	Reservation counter of the tape (RESERVATION-COUNT)

Example

In this example, the following information from the file $SYSMAREN.MARENLOG.14 is displayed:

– after pressing DUE, the first logging record for the tape “A00001”
– after entering LIST=TST001, all logging entries for the tape “TST001” in abbreviated form

```
//show-maren-file :data:$sysmaren.marenlog.14
%  MARM1E3 ENTER: FROM=VSN / LIST=VSN / VSN / +N / -N / ++ / -- / 'ETX' / END
*
VOLUME    = A00001       FILE-SEQ      = 0001          DEV-TYPE    =  TAPE-C4

USER-ID   = MAREN001     HOME-LOCATION = LOCATI01      RESERV-DATE =  <date>
ACCOUNT   =              FREE-LOCATION = LOCATI01      FREE-DATE   =  <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = CENTRAL       EXPORT-DATE =
PASSWORD  = NONE
REMARK    = C'                         '
EXPORT-AD = C'                                                 '
USER-FIELD= C'                                                    '
FILE-NAME =
FREE-POOL = *NO
OPEN-MODE =             CR-DATE      =             LAST-ACC-DATE    =
DEV-NAME  =             CR-TIME      =             LAST-ACC-TIME    =
VOL-SEQ   = 0001        CR-CAT-ID    =             LAST-ACC-USER-ID =
FIRST-VOL = A00001      CR-USER-ID   =             LAST-ACC-ACCOUNT =
CLOSE-IND =             CR-JOB-NAME  =             LAST-ACC-JOB-NAME=
EXPIR-DATE=             LAST-CL-DATE =             LAST-ACC-TSN     =
AUDIT     = NO          LAST-CL-TIME =             LAST-ACC-SNO     =
VOL-STATUS= RESERVED    RESERV-COUNT = 0001        LAST-ACC-HOSTNAME=
INIT      = YES         ACCESS-COUNT = 00000000    LAST-ACC-FUN-NAME= ADD
ADM-FIELD = C'         'CHECK-COUNT  = 01          LAST-ACC-FUN-FLAG= 11
** LOGGING RECORD WRITTEN AT DATE: <date> AT TIME: <time> ON PVS: PI1B **
%  MARM1E3 ENTER: FROM=VSN / LIST=VSN / VSN / +N / -N / ++ / -- / 'ETX' / END
*list=tst001
-------------------------------------------------------------------------------
VOLUME FSEQ C# FUNCNAME FF LOG-DATE   LOG-TIME  C-ID HOSTNAME STA DV MN TSN  R#
-------------------------------------------------------------------------------
TST001 0001 34 MODIFY1  23 <date>     <time>   PI1B          R  BC         0013
TST001 0001 35 FREE     23 <date>     <time>   PI1B          F  BC         0013
TST001 0001 36 MARENUCP 17 <date>     <time>   PI1B          R  BC         0014
TST001 0001 37 MARENONS 23 <date>     <time>   PI1B D241ZE14 R  BC    2004 0014
TST001 0001 38 MARENOO2 23 <date>     <time>   PI1B D241ZE14 R  BC HH 2004 0014
TST001 0001 39 MARENONR 23 <date>     <time>   PI1B D241ZE14 R  BC HH      0014
TST001 0001 40 MARENOC1 23 <date>     <time>   PI1B D241ZE14 R  BC HH      0014
TST001 0001 41 MODIFY1  23 <date>     <time>   PI1B D241ZE14 R  BC HH      0014
TST001 0001 42 FREE     23 <date>     <time>   PI1B D241ZE14 F  BC HH      0014
TST001 0001 43 MARENUCP 17 <date>     <time>   PI1B          R  BC         0015
TST001 0001 44 MARENONS 23 <date>     <time>   PI1B D241ZE14 R  BC    2065 0015
TST001 0001 45 MARENOO2 23 <date>     <time>   PI1B D241ZE14 R  BC HG 2065 0015
TST001 0001 46 MARENONR 23 <date>     <time>   PI1B D241ZE14 R  BC HG      0015
TST001 0001 47 MARENOC1 23 <date>     <time>   PI1B D241ZE14 R  BC HG      0015
TST001 0001 48 MODIFY1  23 <date>     <time>   PI1B D241ZE14 R  BC HG      0015
TST001 0001 49 FREE     23 <date>     <time>   PI1B D241ZE14 F  BC HG      0015
TST001 0001 50 MARENUCP 17 <date>     <time>   PI1B          R  BC         0016
TST001 0001 51 MARENONS 23 <date>     <time>   PI1B D241ZE14 R  BC    2259 0016
TST001 0001 52 MARENOO2 23 <date>     <time>   PI1B D241ZE14 R  BC HG 2259 0016
*end
%  MARM170 STATEMENT '//SHOW-MAREN-FILE' PROCESSED
```

The display is terminated with END.

SHOW-MAREN-PARAMETERS
Show system-specific MAREN parameters

Privilege ADA, DA, administrator without domains

This statement is used to display the current values of the system-specific parameters of a system. When you use domains a list of the systems which belong to the currently administered domain is also output. If the ADA enters this statement, this list is the list of all systems with their associated domains.

It also logs the exit routines used by MARENCP and MARENUCP.
The existing free tape pools are output after the system-specific parameters are output.

Format

SHOW-MAREN-**PAR**AMETERS	Alias: **SHMP**
HOST-NAME = ***OWN** / <alphanum-name 1..8> ,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM	

Operands

HOST-NAME = *OWN / <alphanum-name 1..8>
Name of the system whose system-specific parameters are displayed. Only the name of a system can be selected which belongs to a domain that is currently being administered.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After an information block has been output, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- The contents of the catalog entry field MAREN-PASSWORD are displayed in plain text only under the user ID TSOS, provided the system was not generated with encryption. Otherwise, only YES or NONE is displayed.
- Setting task switch 5 causes MAREN parameters to be listed line by line in interactive mode rather than in a single display screen. This improves the readability of the MAREN parameters in SYSOUT logs. In batch mode, output is generally on a line-by-line basis.

Example

Statement entered by ADAs:

```
//show-maren-parameters
HOST-NAME = D017ZE15  SNO        = 041     DOMAIN = *STD-DOM    ADA-ALLOW = N

EXP-PROC     = Y      INPUT-F-CH = N       FOREIGN-T-CH = N     TSOS-PRIV = N
EXP-FOREIGN  = N      INPUT-T-CH = Y       RETPD-CHECK  = Y     DEV-COMPL = Y
EXP-ADDR-ACK = N      AUDIT      = YES     TEST-MODE    = N     LOGGING   = N
EXP-RECEIPT  = NO

BATCH-REQ-TIME=01800  DEF-FREE-DATE = 0007     ARCH-WORK-TIME = (00:00,24:00)
BATCH-EX-TIME =00100  DEF-HOME-LOC  = BABLOC1  PRIV-USER-ID   =
DIAL-REQ-TIME =00180  DEF-DEV-TYPE  = TAPE-C4  EXITS          = NONE
DIAL-EX-TIME  =00050  DEF-USER-ACC  = FOREIGN-READ-ONLY
CID-UID       = Y     DEF-ADM-SCOPE = *OWN     LAYOUT-FOR-SHOW= MAXIMUM
MOUNT-CH-INT  = 0060                           RESERVATION-SEQ= VSN
OVERRULE-LOC  = YES                            OPERATOR-ROLE  = SYSMAREN

MAREN-PASSWORD=NONE

RES-DEV-TYPES =(TAPE-C4 /TAPE-U2 /TAPE-U3 /TAPE-C5 /TAPE-C6/TAPE-U4/TAPE-U4E)


%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)?y
```

```
LOCATION-ENTRIES:(LOCATION-NAME,SYMBOLIC-NAME,TYPE,OPERATING-MODE)
  (ROBOTER1,ROBOTER1,LOCAL ,ROBAR-1 )    (CSTOR1  ,CSTOR1  ,LOCAL ,ROBAR-2 )
  (CSTOR2  ,CSTORF  ,LOCAL ,ROBAR-2 )    (CENTRAL ,CENTRAL ,LOCAL ,MANUAL  )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
  (        ,        ,      ,        )    (        ,        ,      ,        )
%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)?y

HOSTS: (HOST-NAME,SESSION-NR,DOMAIN,ADA-ALLOWED,DEF-ADMIN-SCOPE)

D017B016 , 055 , *STD-DOM , N , OWN
D017ZE15 , 041 , *STD-DOM , N , OWN
D017ZE16 , 061 , *STD-DOM , N , OWN
D017ZE39 , 036 , *STD-DOM , N , OWN
JUANA1   , 127 , *STD-DOM , N , OWN
LEIBNIZ2 , 086 , *STD-DOM , N , OWN
LEIBNIZ9 , 003 , *STD-DOM , N , OWN

%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)?y
LIST OF FREE-POOL NAMES:

*FP.NOV14.001
*NO
*TSOS
:4V09:$TSOS.CLMDIR
%  MARM222 4 FREE-POOL NAMES DISPLAYED
```

SHOW-MAREN-STATUS
Show status of MAREN

Privilege ADA, DA, administrator without domains

This statement provides an overview of MAREN's current status. It displays information on the MAREN subsystem, the control task MARENCP, and the automatic free tape allocation facility MARENUCP. This information can also be called by all connected systems in the MAREN network.

DAs can only execute the statement in their own domain. The *ALL-FROM-DOMAIN specification is thus meaningless for them.

Format

SHOW-MAREN-**STATUS** Alias: **SHMS**

HOST-NAME = ***OWN** / ***ALL** / <alphanum-name 1..8> / ***ALL-FROM-DOMAIN** (...)

***ALL-FROM-DOMAIN**
DOMAIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

Operands

HOST-NAME =
System for which the MAREN status is to be displayed.

HOST-NAME = *OWN
Information is only output by the local system.
If the ADA has used the MODIFY-ADMINISTRATION-SCOPE DOMAIN=... statement to become the DA of a domain, HOST=*OWN addresses the system which was determined by the HOST operand in the MODIFY-ADMINISTRATION-SCOPE statement.

HOST-NAME = *ALL
When domains are used, the information on all systems of the user's own domain is output for the DA, and information on all systems for the ADA.

HOST-NAME = <alphanum-name 1..8>
Name of a system.
If the DA enters the name of a system when domains are being used, this system must belong to the DA's own domain.

HOST-NAME = *ALL-FROM-DOMAIN (...)
Information on the systems from specific domains is shown. This operand may only be used by the ADA.

DOMAIN =
Selects the domain.

DOMAIN = *STD-DOMAIN
Information on the systems of the standard domain is shown.

DOMAIN = *OWN
Information on the systems of the user's own domain is shown.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
Information on the systems of the specified domain is shown.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After an information block has been output, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

Notes

- The following information is displayed for each system:
  - Name of the system
  - TSN of the control task MARENCP
  - TSN of the automatic free tape allocation facility MARENUCP
  - Status of the MAREN catalog (FREE/LOCKED/UNLOCKED)
  - Transaction status of the subsystem (INACTIVE/ANNOUNCE/ACTIVE/FETCH)
  - TSN and archive number of the last transaction
  - Name of the logging file
  - Location Manager File (name of the reservation file) for MARENCP and MARENUCP
  - Name of the exit module library for MARENCP and MARENUCP
- For information transfer in the network, active connections must exist between the system with the MAREN catalog and the other systems of the MAREN network. For this purpose, the HIPLEX MSCF subsystem must be loaded. The statement with the parameter HOST-NAME=*OWN works even if this requirements are not fulfilled.

Examples

Example 1: Status inquiry from the local system

```
//show-maren-status
================================================================================
HOSTNAME MARENCP MARENUCP CATALOG    ===  TRANSACTION   ===   DOMAIN  SUB-SYS
           TSN     TSN    STATUS     STATUS   LA-TSN LA-VSN           VERSION
================================================================================
LEIBNIZ4   5TAM    5TAX   UNLOCKED   INACTIVE  5TAX          HSMSTES<version>
--------------------------------------------------------------------------------
MAREN-CATALOG : :FSAU:$SYSMAREN.MARENCAT
%  MARM103 CONTINUE ACTION? REPLY (Y=YES; N=NO)?
Y
================================================================================
HOST-NAME
LINK-NAME   EXIT#       FILE-NAME
================================================================================
LEIBNIZ4
MARENLOG                :BUR7:$SYSMAREN.MAREN.LOGGING
MARENLMF/CP             :FSAU:$SYSMAREN.MARENLMF
MARENLMF/UCP            :FSAU:$SYSMAREN.MARENLMF
MARENLIB/CP (1,3,5)     :BUR7:$SYSMAREN.MARENLIB
MARENLIB/UCP(1,6)       :BUR7:$SYSMAREN.MARENLIB
%  MARM170 STATEMENT '//SHOW-MAREN-STATUS' PROCESSED
```

After an information block has been output, the message `MARM103` is issued to inquire whether the operation is to be continued.

Example 2: Status inquiry from all systems in the MAREN network

```
//show-maren-status host=*all
================================================================================
HOSTNAME MARENCP MARENUCP CATALOG    ===  TRANSACTION   ===   DOMAIN  SUB-SYS
           TSN     TSN    STATUS     STATUS   LA-TSN LA-VSN           VERSION
================================================================================
LEIBNIZ4   5TAM    5TAX   UNLOCKED   INACTIVE  5TDQ          HSMSTES<version>
D017ZE15   400J    400K   UNLOCKED   INACTIVE  41HT  QE3009  HSMSTES<version>
%  MARM197 ACCESS TO HOST 'D017ZE19' NOT POSSIBLE
D017ZE39   2B9I    2B91   UNLOCKED   INACTIVE  2RDX  QE0574  HSMSTES<version>
--------------------------------------------------------------------------------
MAREN-CATALOG : :FSAU:$SYSMAREN.MARENCAT.OS
================================================================================
HOST-NAME
 LINK-NAME   EXIT#       FILE-NAME
================================================================================
LEIBNIZ4
 MARENLOG                :BUR7:$SYSMAREN.MAREN.LOGGING
 MARENLMF/CP             :FSAU:$SYSMAREN.MARENLMF.OS
 MARENLMF/UCP            :FSAU:$SYSMAREN.MARENLMF.OS
 MARENLIB/CP  (1,3,5)    :BUR7:$SYSMAREN.MARENLIB
 MARENLIB/UCP (1,6)      :BUR7:$SYSMAREN.MARENLIB
D017ZE15
 MARENLOG                :SBZ7:$SYSMAREN.MAREN.LOGGING
 MARENLMF/CP             :FSAU:$SYSMAREN.MARENLMF.OS
 MARENLMF/UCP            :FSAU:$SYSMAREN.MARENLMF.OS
 MARENLIB/CP  (1,3,5)    :SBZ7:$SYSMAREN.MARENLIB
 MARENLIB/UCP (1,6)      :SBZ7:$SYSMAREN.MARENLIB
D017ZE39
 MARENLOG                :BU7B:$SYSMAREN.MAREN.LOGGING
 MARENLMF/CP             :FSAU:$SYSMAREN.MARENLMF.OS
 MARENLMF/UCP            :FSAU:$SYSMAREN.MARENLMF.OS
 MARENLIB/CP  (1,3,5)    :BU7B:$SYSMAREN.MARENLIB
 MARENLIB/UCP (1,6)      :BU7B:$SYSMAREN.MARENLIB
%  MARM170 STATEMENT '//SHOW-MAREN-STATUS' PROCESSED
```

If the message MARM197 is output for a system, no further information is output for this system. If MARENCP-TSN or MARENUCP-TSN contains blanks, this means the program is not loaded on the system concerned.

“CLOSED” is output after the file name of the MAREN catalog if the latter has been closed (at least) on the first system in the list using the CLOSE-MAREN-FILES statement.

If MARENCP has been unloaded, the file name of the MAREN catalog is still output. It is possibly being accessed by other MAREN entities or other systems.

SHOW-VOLUME-ATTRIBUTES
Show information from the MAREN catalog

Privilege ADA, DA, administrator without domains

This statement outputs information from a MAREN catalog file to SYSOUT. If an individual archive number is entered, its complete catalog entry is shown. If a number range is entered or *ALL is specified, selected important catalog entry fields are output.
If an output file is specified, the complete catalog entries of the specified tapes are output. The file can also be created in CSV format to permit spreadsheet processing. It can also be specified that the file is sent by email after it has been created.

Lists with information from the MAREN catalog are created by the PRINT-VOLUME-ATTRIBUTES statement, see page 344.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

SHOW-VOLUME-**ATTR**IBUTES Aliasr: **SH** / **SHVA**

VOLUME = ***ALL** / ***INT**ERVAL(...) / <vsn>(...)

***INT**ERVAL(...)
FROM = ***FIRST** / <vsn>
,**TO** = ***LAST** / <vsn>
,**FROM-FSEQ** = **1** / <integer 1..9999>

<vsn>(...)
FILE-**SEQ**UENCE = **1** / <integer 1..9999>

,**USER-ID**ENTIFICATION = ***ALL** / <filename 1..8 with-wild>

,**DOMAIN** = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

,**FI**LE-**NAME** = ***ALL** / ***NONE** / <filename 1..41 without-cat-user-gen-vers with-wild>(...) /
<filename 1..41 without-cat-user-gen-vers>(...)

<filename 1..41 without-cat-user-gen-vers with-wild>(...)
VOLUME = ***ANY** / ***NEXT**(...)
***NEXT**(...)
FROM = ***FIRST** / <vsn>
,**FROM-FSEQ** = <integer 1..9999>

(part 1 of 2)

<filename 1..41 without-cat-user-gen-vers>(...)
| **VERSION** = ***ALL** / ***LATEST** / <integer -9999..0> / ***NOT-CREATED**
| ,**TYPE-OF-VOL**UMES = ***ANY** / ***VALID**(...) / ***OBSOLETE**
| ***VALID**(...)
| | **CLOSE-CHECK** = ***NO** / ***Y**ES

,**DIR**ECTORY-**NAME** = ***ALL**(...) / ***NONE** / <filename 1..54 without-gen-vers> (...)

***ALL**(...)
| **DIR**ECTORY-**ON-VOL**UME = ***ANY** / ***Y**ES

<filename 1..54 without-gen-vers> (...)
| **SAVE-FI**LE-**ID** = ***ALL / *LATEST** / <integer -32767..0> / <composed-name 15..15>
| ,**DIR**ECTORY-**ON-VOL**UME = ***ANY** / ***Y**ES

,**FREE-POOL** = ***ALL** / ***NO / *GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> / <text 2..32 without-sep>

,**HOME-LOC**ATION = ***ALL** / <alphanum-name 1..8>

,**DEV**ICE-**TYPE** = ***ALL** / ***ALL-TAPES** / ***STD** / <structured-name 1..8>

,**OUTP**UT = ***SYSOUT** / ***NONE** / <filename 1..54> / <filename 1..54 without-gen-vers>(...)

<filename 1..54 without-gen-vers>(...)
| **FORMAT** = ***MAREN-STRUCTURE** / ***CSV**(…)
| ***CSV**(…)
| | **SEPARATOR** = ***SEMICOLON** / ***COMMA**
| | ,**HEADER-LINE** = ***Y**ES / ***NO**
| ,**SEND-BY-MAIL** = ***NO** / ***Y**ES(...)
| ***Y**ES(...)
| | **TO** = ***USER**(...)
| | ***USER**(...)
| | | **USER-ID**ENTIFICATION = ***OWN** / <name 1...8>
| | ,**SUBJECT** = ***STD** /<c-string 1...256>
| | ,**DEL**ETE-**FI**LE = ***NO** / ***Y**ES / ***DESTROY**

,**STRUCTURE-OUTP**UT = ***NONE** / <composed-name 1..255> (...)

<composed-name 1..255> (...)
| **WRITE-MODE** = ***REPLACE** / ***EXTEND**

,**VOL**UME-**GR**OUP = ***ANY** / ***NONE** / <text 1..32 without-sep>

,**OV**ERFLOW-**CONTROL** = ***BY-PROG**RAM / ***BY-SYS**TEM

,**INF**ORMATION = ***STD** / ***NORM**AL / ***MAX**IMUM / ***V8.1-AND-LOWER** [1]

(part 2 of 2)

[1] The Operand value `*V8.1-AND-LOWER` is obsolete. It can still be specified for compatibility reasons.

Operands

VOLUME =
Archive numbers of tapes about which information is required.

VOLUME = *ALL
All tapes are processed.

VOLUME = *INTERVAL (...)
All tapes whose archive number lies within the range specified below are processed.

FROM = *FIRST
All tapes are processed, starting with the lowest available archive number.

FROM = <vsn>
Archive number. All tapes whose archive number is greater than or equal to the specified archive number are processed.

TO = *LAST
All tapes are processed up to the highest existing archive number.

TO = <vsn>
Archive number. All tapes whose archive number is less than or equal to the specified archive number are processed.

FROM-FSEQ = 1 / <integer 1..9999>
File sequence number of the FROM operand. Specifies the precise file sequence number at which processing is to begin. This operand is relevant only if the statement is issued via the MAREN program interface.

VOLUME = <vsn>(...)
Archive number of the desired tape.

FILE-SEQUENCE = 1 / <integer 1..9999>
Specifies which file sequence number of the specified VSNs is to be processed.

USER-IDENTIFICATION = *ALL / <filename 1..8 with-wild>
All catalog entries assigned to this user ID are displayed. The wildcard “*” can also be specified as the last character of the user ID (e.g. TEST*). In this case, all archive numbers from all user IDs which begin with the character string specified (TEST) are selected. Wildcards other than “*” are not permitted.

USER-IDENTIFICATION = *ALL
No selection is made regarding the user ID.

DOMAIN =
Defines the domain on whose tapes information is to be output.

DOMAIN = *ANY
Selects all domains.

DOMAIN = *OWN
The user's own domain is selected.
The user's own domain is the domain of the system on which the ADA is currently working or the domain in which he/she has taken over the DA role.

DOMAIN = *STD-DOMAIN
The standard domain is selected.

DOMAIN = <alphanum-name 1..8>
The specified domain is selected.

If domains are used, the DA is shown free tapes either from the standard domain or from his/her own domain. This is dependent on which value the domain-specific FREE-VOLUMES operand has.
The ADA is shown free tapes of the domain which is specified with the DOMAIN operand.

FILE-NAME =
This allows you to limit output to catalog entries with a specific file name.

FILE-NAME = *ALL
All catalog entries which contain a file name are output.
The default value *ALL is taken into account only if *ALL or *NONE is specified in the DIRECTORY-NAME operand.

FILE-NAME = *NONE
Catalog entries which contain a file name are not output.

FILE-NAME = <filename 1..41 without-cat-user-gen-vers with-wild>(...)
An asterisk (*) can be specified as the last character of the file name (e.g. PROG*). In this case, all catalog entries for all file names which begin with the character string specified ("PROG") are selected. The VOLUME operand can be used to define the archive number with which output is to begin.

VOLUME = *ANY / *NEXT(...)
Tape with which output is to begin.
This operand must be specified for the MAREN program interface. It ensures that all catalog entries can be read. In interactive mode, it is possible to specify the tape with which output is to begin.
The default value is *ANY, i.e. all catalog entries relating to files that match the specified string are output.

VOLUME = *NEXT(...)
All catalog entries after the specified catalog entry whose file names match the specified string are output.
Thus all entries can be listed for the MAREN program interface.
The last catalog entry read must be specified in the FROM and FROM-FSEQ operands.

FROM = <vsn>
Archive number of the tape with which output is to begin.

FROM-FSEQ = <integer 1..9999>
File sequence number which matches the archive number.

FILE-NAME = <filename 1..41 without-cat-user-gen-vers>(...)
Only catalog entries with this file name are output.

VERSION =
This operand can be used to select a specific version (or status) of the specified file for which the associated tapes are to be output.
It is not evaluated if a single archive number is specified in VOLUME or the wildcard “*” is specified in the USER-ID operand.

VERSION = *ALL
Selects all versions which exist for the specified file name.

VERSION = *LATEST
Selects the latest version of the file (i.e. the last one created).

VERSION = <integer -9999..0>
Specifying 0 is equivalent to specifying *LATEST, specifying -1 indicates the penultimate file status, etc.

VERSION = *NOT-CREATED
Selects only those tapes which have been reserved with the specified file name but which have not been used (the CREATION-DATE and CREATION-TIME catalog entry fields have not been set). The TYPE-OF-VOLUMES setting is of no consequence in this case and is therefore not interpreted.

TYPE-OF-VOLUMES =
This operand selects the volume sequences (catalog entry field VOLUME-SEQUENCE) within a tape set. These numbers are usually unique. Some numbers may be duplicated following a restart.

If the following are specified, the TYPE-OF-VOLUMES operand is ignored:
– VERSION=*NOT-CREATED
– VOLUME=<vsn>
– User ID in USER-IDENTIFICATION with wildcard “*”.

TYPE-OF-VOLUMES = *ANY
The volume sequences for a tape set are not checked to establish whether they occur more than once.

TYPE-OF-VOLUMES = *VALID(...)
If a volume sequence occurs more than once in a tape set, the one created most recently is selected.

CLOSE-CHECK =
This operand allows you to select whether the catalog entry fields CLOSE-INDICATOR should be evaluated.

If the following are specified, the CLOSE-CHECK operand is ignored:
– VERSION=*NOT-CREATED
– VOLUME=<vsn>
– User ID in USER-IDENTIFICATION with wildcard “*”.

CLOSE-CHECK = *NO
The CLOSE-INDICATOR catalog entry field is not evaluated.

CLOSE-CHECK = *YES
If the CLOSE-INDICATOR catalog entry field is not set to CLOSED for one of the tapes in the tape set, the statement is aborted.

TYPE-OF-VOLUMES = *OBSOLETE
If tape sequence numbers occur more than once for a tape set, all are selected except the one most recently created.

DIRECTORY-NAME =
Only tapes which are assigned to the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own user ID and standard catalog ID can be omitted.

DIRECTORY-NAME = *ALL(...)
All catalog entries which contain the name of a directory are output.
The default value *ALL is taken into account only if *ALL or *NONE is specified in the FILE-NAME operand.

DIRECTORY-ON-VOLUME = *ANY / *YES
Specifies whether the output should be restricted to tapes which contain a directory at the end of the tape. The default *ANY causes tapes to be displayed irrespective of whether they contain a directory.

DIRECTORY-NAME = *NONE
Catalog entries containing the name of a directory are not output.

DIRECTORY-NAME = <filename 1..54 without-gen-vers> (...)
Only tapes from this directory are selected. The selection may already have been limited using the VOLUME operand. The tapes are output in ascending order of their SUB-SAVE-NUMBER and SUB-SEQUENCE-NUMBER (not their archive numbers).

SAVE-FILE-ID =
The tapes that are to be exported are selected using the save file of the directory specified above.

SAVE-FILE-ID = *ALL
All tapes from this directory are to be displayed.

SAVE-FILE-ID = *LATEST
All tapes listed in the last, i.e. most recent save file are selected.

SAVE-FILE-ID = <integer -32767..0>
All tapes listed in the nth save file are selected (the older the save file, the larger the number n). 0 equals *LATEST. Example: if -5 is specified, the tapes are selected from the last save file but five.

SAVE-FILE-ID = <composed-name 15..15>
All tapes in the save file with the specified SAVE-FILE-ID are selected. The SAVE-FILE-ID has the following format: `S.yymmdd.hhmmss`.

DIRECTORY-ON-VOLUME = *ANY / *YES
Specifies whether the output should be restricted to tapes which contain a directory at the end of the tape. The default *ANY causes tapes to be displayed irrespective of whether they contain a directory.

FREE-POOL =
Selects the catalog entries to be made available on the basis of the free tape pool.

FREE-POOL = *ALL
No selection is made regarding a specific free tape pool.

FREE-POOL = *NO
Only free tapes assigned to the *NO free tape pool are selected.

FREE-POOL = *GLOBAL
Only free tapes assigned to the *GLOBAL free tape pool are selected.

FREE-POOL = *TSOS
Only free tapes assigned to the *TSOS free tape pool are selected.

FREE-POOL = <filename 1..54 without-gen-vers>
Only free tapes assigned to the free tape pool for HSMS/ARCHIVE applications using the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other. “*” can be entered as the last character. In this case all catalog entries in all free tape pools will be listed, which begin with the specified character string. The sort criteria will apply only within the individual free tape pools.

HOME-LOCATION =
Location name or symbolic location name. All catalog entries with the specified permanent location are processed.

HOME-LOCATION = *ALL
All permanent locations are processed.

HOME-LOCATION = <alphanum-name 1..8>
All catalog entries with the specified permanent location are processed.

DEVICE-TYPE =
Device type.

DEVICE-TYPE = *ALL
The catalog entries of all device types are output.

DEVICE-TYPE = *ALL-TAPES
The catalog entries of all tapes are listed.

DEVICE-TYPE = *STD
All tapes of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified in the MODIFY-MAREN-PARAMETERS statement are listed.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

OUTPUT =
Determines the output medium.

OUTPUT = *SYSOUT
Output is directed to SYSOUT.

OUTPUT = *NONE
No output takes place. This specification only makes sense for structured output in an S variable (see the STRUCTURE-OUTPUT operand).

OUTPUT = <filename 1..54>
Only for specifying a file generation.
Output is directed to the specified file generation in MAREN format. Passwords are overwritten with C'$$$$'. Only the number of records written is displayed on SYSOUT.

OUTPUT = <filename 1..54 without-gen-vers>(...)
Name of the SAM output file to which all selected catalog entries are to be written. Passwords are overwritten with C'$$$$'. Only the number of records written is displayed on SYSOUT. The output format and transfer by email can also be specified.

FORMAT =
Determines the format of the output file.

FORMAT = *MAREN-STRUCTURE
Output takes place in MAREN format.

FORMAT = *CSV(…)
Output takes place in CSV (comma separated value) format. Files in CSV format can be read in so that the columns are retained, and they can be processed further with a spreadsheet program (e.g. EXCEL).

SEPARATOR = *SEMICOLON / *COMMA
Determines the separator which is to be set between the various output values. The default separator is a semicolon (;). Optionally a comma (,) can be used as the separator.

HEADER-LINE = *YES / *NO
Specifies whether a header line should be output to name the output columns. The default is *YES, i.e. the header line is output. The header line contains the names of the catalog entry fields.

SEND-BY-MAIL = *NO / *YES(...)
Specifies whether the output file should be sent by email. The default is *NO, i.e. it is not sent by email. Transfer by email takes place only if the file to be sent contains at least one entry.

SEND-BY-MAIL = *YES(...)
The output file should be sent as an email attachment. The recipient is addressed by means of his/her user ID, i.e. the email address is taken from the user entry concerned.

TO = *USER(...)
Details of transfer by email:

USER-IDENTIFICATION = *OWN / <name 1...8>
Specifies the user ID. The recipient's email address is taken over from this user entry. If the user entry contains more than one email address, all the addresses are taken over as recipients. The default is *OWN, i.e. the caller's user ID.

SUBJECT = *STD /<c-string 1...256>
Determines the content of the email's "Subject" field.
The default is *STD, i.e. MAREN uses a standard text, such as
`MARENADM STATEMENT SHOW-VOLUME-ATTRIBUTES, FILENAME: <filename>`

DELETE-FILE = *NO / *YES / *DESTROY
Specifies whether the file should be automatically deleted after it has been sent.
The default is *NO, i.e. the file is not deleted.
*YES causes the file to be deleted after it has been sent. *DESTROY also causes it to be deleted, and the memory space is overwritten with binary zeros.

STRUCTURE-OUTPUT =
Controls the structured output in S variables.

STRUCTURE-OUTPUT = *NONE
No structured output takes place.

STRUCTURE-OUTPUT = <composed-name 1..255>(...)
Name of the S variable to be used for the structured output.

WRITE-MODE =
Determines whether the output should replace or extend the current content of the S variables.

WRITE-MODE = *REPLACE
The current content of the S variable is replaced by the new output.

WRITE-MODE = *EXTEND
The new output extends the current content of the S variable.

VOLUME-GROUP = *ANY / *NONE / <text 1..32 without-sep>
Only those tapes are output which are assigned to the specified volume group. When *ANY is specified, the volume group to which the tape belongs is irrelevant. When *NONE is specified, the tape may not be assigned to a volume group. “*” can be entered as the last character. In this case the catalog entries for all volume groups which begin with the specified string are listed.

OVERFLOW-CONTROL =
Type of screen overflow control in interactive mode.

OVERFLOW-CONTROL = *BY-PROGRAM
Control by the program: After eighteen catalog entries have been processed, a message is displayed inquiring whether the current operation is to be continued or aborted.

OVERFLOW-CONTROL = *BY-SYSTEM
Control by BS2000: Screen overflow control is based entirely on the system parameter TCHOFLO or the value set in the MODIFY-TERMINAL-OPTIONS command.

INFORMATION =
If a single tape is specified, this operand determines the output format for output to SYSOUT.

INFORMATION = *STD
The output format is determined on the basis of the MAREN parameters if no previous entry (SHOW-INFORMATION=NORMAL, MAXIMUM) modified the standard format for this particular program run.

INFORMATION = *NORMAL
Output will contain all essential information. Output is not guaranteed and may be changed again in future software versions. If *NORMAL is specified, this will remain the new standard until the program is loaded the next time.

INFORMATION = *MAXIMUM
The output contains all information. Output is not guaranteed and may be changed again in future software versions. If *MAXIMUM is specified, this will remain the new standard until the program is loaded the next time.

Notes

- Only one of the operands FILE-NAME and DIRECTORY-NAME may ever have an operand value other than the default *ALL.
- If a number range is specified with the operand FILE-NAME=*ALL (default value), only the catalog entry with the first FSEQ is displayed. If a value other than *ALL is specified for FILE-NAME, all relevant FSEQs are output. Specifying FILE-NAME=* and USER-ID=*ALL in turn causes merely the output of the first FSEQ of a tape.
- If an individual archive number is specified and this is not found in the MAREN catalog, or a number range is specified an no catalog entry is found within this range, the spin off is triggered.
- The contents of the catalog entry field PASSWORD appear in plain text only under the user ID TSOS. Otherwise, only YES or NONE is displayed.
- Users should bear in mind that the use of wildcards may result in long wait times, especially if only a few catalog entries fulfill the specified selection criteria.
- If an individual archive number is specified, all catalog entry fields are displayed. By default, information is entered in a single screen in interactive mode, whereas in batch mode it is entered line by line. Setting task switch 5 causes the output to appear line by line in interactive mode. This improves the readability of catalog entries in SYSOUT logs.
- Specification of a single archive number will be rejected if made together with the parameter FILE-NAME=<filename>(...) and if non-default values are used for its VERSION and TYPE-OF-VOLUMES operands.
- When a list of tapes is displayed, the VOLUME GROUP column appears only when the VOLUME-GROUP operand contains a wildcard. If another selection operand is also specified, another display layout may be preferred internally in MAREN.

Examples

Example 1: Output of a single MAREN catalog entry

```
//show-volume-attributes volume=hlsQ13,inf=*normal
VOLUME    = HLSQ13       FILE-SEQ      = 0001          DEV-TYPE    =  TAPE-C4
USER-ID   = TSOS         HOME-LOCATION = VTLSLOC       RESERV-DATE =  <date>
ACCOUNT   = ADMINSTR     FREE-LOCATION = VTLSLOC       FREE-DATE   =  <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = VTLSLOC       EXPIR-DATE  =
PASSWORD  = NONE
EXPORT    = C'                                                    '  /
REMARK /1 = C'                         ' /2 = C'          ' /3 = C'          '
USER-FIELD= C'                                                      '
DIR-NAME  = :3VO6:$TSOS.ARC.DIR.2
SAVE-FILE =                SUBSAVE/SEQ =   /     CR-JOB/REQUEST-NA  = BS15FRO
FREE-POOL = *NO                                  CR-CAT-ID          = SXV7
VOL-GROUP =                                      CR-USER-ID         = TSOS
VOL-SEQ   = 0001       CR-DATE      =            LAST-ACC-DATE      =
FIRST-VOL =            CR-TIME      =            LAST-ACC-TIME      =
CLOSE-IND =            LAST-CL-DATE =            LAST-ACC-USER-ID   =
VOL-STATUS= RESERVED   LAST-CL-TIME =            LAST-ACC-ACCOUNT   =ADMINSTR
INIT      = NO         REG-DATE     =            LAST-ACC-JOB-NAME  =
ADM-FIELD = C'        ' /2 = C'               ' LAST-ACC-TSN       =
                                                 LAST-ACC-HOSTNAME  =
                                                 LAST-WRITE-BLK-CNT =
```

Information output with the most important information.

```
//show-volume-attributes volume=hlsQ13,inf=*maximum
VOLUME    = HLSQ13       FILE-SEQ      = 0001          DEV-TYPE    =  TAPE-C5
USER-ID   = TSOS         HOME-LOCATION = VTLSLOC       RESERV-DATE =  <date>
ACCOUNT   = ADMINSTR     FREE-LOCATION = VTLSLOC       FREE-DATE   =  <date>
USER-ACC  = OWNER-ONLY   TEMP-LOCATION = VTLSLOC       EXPIR-DATE  =
PASSWORD  = NONE
EXPORT    = C'                                                    '  /
REMARK /1 = C'                        ' /2 = C'          ' /3 = C'          '
USER-FIELD= C'                                                   '
DIR-NAME  = :3VO6:$TSOS.ARC.DIR.2
SAVE-FILE =                  SUBSAVE/SEQ =   /    REQUEST-NAME       = BS15FRO
FREE-POOL = *NO
VOL-GROUP =
VOL-SEQ   = 0001       CR-DATE      =            LAST-ACC-DATE      =
FIRST-VOL =            CR-TIME      =            LAST-ACC-TIME      =
CLOSE-IND =            LAST-CL-DATE =            LAST-ACC-USER-ID   =
VOL-STATUS= RESERVED   LAST-CL-TIME =            LAST-ACC-ACCOUNT   =ADMINSTR
INIT      = NO         REG-DATE     =            LAST-ACC-JOB-NAME  =
ADM-FIELD = C'        ' /2 = C'               ' LAST-ACC-TSN       =
                                                 LAST-ACC-HOSTNAME  =
                                                 LAST-WRITE-BLK-CNT =
OPEN-MODE =            ACCESS-COUNT = 00000054   LAST-ACC-SNO       =
DEV-NAME  =            RESERV-COUNT = 0058       LAST-ACC-FUN-NAME  = MODIFY
AUDIT     = NO         CHECK-COUNT  = 56         LAST-ACC-FUN-FLAG  = 23
DOMAIN    = *STD-DOM   DIR-ON-VOL   =
```

Information output with all information.

Example 2: Output of a tape number range

```
//show-volume-attributes volume=*interval(from=id5000,to=id6000)
------------------------------------------------------------------------------
VOLUME FSEQ DEV-TYPE USER-ID  ACCOUNT  RES-DATE FREE-DATE  HOME-LOC ACC# E FL
------------------------------------------------------------------------------
ID5001 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0001   R
ID5002 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0000  R
ID5003 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0015   R
ID5004 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0004   R
ID5005 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0000   R
ID5006 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0008 E R
ID5007 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0000   R
ID5008 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0021K  R
ID5009 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0014   R
ID5010 0001 TAPE-C4  USER1    ACC2     <date>   <date>     CENTRAL  0000   R
ID5011 0001 TAPE-C4  USER2    ACC081   <date>   <date>     CENTRAL  0000   R
ID5012 0001 TAPE-C4  USER2    ACC081   <date>   <date>     CENTRAL  0000   R
ID5013 0001 TAPE-C4  USER2    ACC081   <date>   <date>     CENTRAL  0000   R
ID5014 0001 TAPE-C4  USER2    ACC081   <date>   <date>     CENTRAL  0045   R
ID5015 0001 TAPE-C4  USER2    ACC081   <date>   <date>     CENTRAL  0002M  R
%  MARM120 TOTAL OF 15 MAREN CATALOG ENTRIES PROCESSED
```

Meaning of the output fields:

VOLUME	VSN
FSEQ	File sequence number Temporarily locked tapes are output with FSEQ='*001'.
DEV-TYPE	Device type
USER-ID	User ID
ACCOUNT	Account number
RES-DATE	Reservation date
FREE-DATE	Expiration date
HOME-LOC	Permanent location
ACC#	Access counter Values from 10,000 through 999,999 are represented as 10K through 999K, greater values as 1M through 99M
E	Flag for exported tapes (E = EXPORTED)
F	Tape status, the following values may be displayed: R, F, P Reserved, free, foreign FU USAGE = BY-MARENUCP

Example 3: Output of all tapes whose file name begins with a specific character string

```
//show-volume-attributes file-name=sample*
------------------------------------------------------------------------------
VOLUME FSEQ CR-DATE  CR-TIME  CR-JOB   1STVSN VSEQ USER-ID  FILE-NAME(SHORT.)
------------------------------------------------------------------------------
GRA001 0001 <date>   <time>   MAREN001 GRA001 0001 MAREN001 SAMPLE.TAPESET.1
GRA002 0001 <date>   <time>   MAREN001 GRA002 0001 MAREN001 SAMPLE.TAPESET.1
GRA003 0001 <date>   <time>   MAREN001 GRA003 0001 MAREN001 SAMPLE.TAPESET.1
GRA004 0001 <date>   <time>   MAREN001 GRA003 0002 MAREN001 SAMPLE.TAPESET.1
GRA005 0001 <date>   <time>   MAREN001 GRA003 0003 MAREN001 SAMPLE.TAPESET.1
GRA006 0001 <date>   <time>   MAREN001 GRA006 0001 MAREN001 SAMPLE.TAPESET.1
GRA007 0001 <date>   <time>   MAREN001 GRA006 0002 MAREN001 SAMPLE.TAPESET.1
GRA008 0001 <date>   <time>   MAREN001 GRA006 0003 MAREN001 SAMPLE.TAPESET.1
GRA009 0001 <date>   <time>   MAREN001 GRA009 0001 MAREN001 SAMPLE.TAPESET.1
GRA010 0001 <date>   <time>   MAREN001 GRA003 0001 MAREN001 SAMPLE.TAPESET.1
GRA001 0002 <date>   <time>   MAREN001 GRA001 0001 MAREN001 SAMPLE.TAPESET.2
GRA002 0002 <date>   <time>   MAREN001 GRA002 0001 MAREN001 SAMPLE.TAPESET.2
GRA001 0003 <date>   <time>   MAREN001 GRA001 0001 MAREN001 SAMPLE.TAPESET.3
GRA002 0003 <date>   <time>   MAREN001 GRA002 0001 MAREN001 SAMPLE.TAPESET.3
%  MARM120 TOTAL OF 14 MAREN CATALOG ENTRIES PROCESSED
```

Meaning of the output fields:

VOLUME	VSN
FSEQ	File sequence number, Temporarily locked tapes are output with FSEQ='*001'
CR-DATE	Creation date
CR-TIME	Creation time
CR-JOB	Creation job name
1STVSN	First archive number of the MF/MV set
VSEQ	File section number
USER-ID	User ID
FILE-NAME	File name (abbreviated if necessary)

Example 4: Output of all MAREN catalog entries to a tape file

All tapes in the MAREN catalog to which the file SAMPLE.TAPESET.1 has been written or at least whose MAREN catalog entry contains this file name are to be output:

```
//show-volume-attributes volume=*all,user-id=*all,
   file-name=sample.tapeset.1(version=*all,type-of-vol=*any)
------------------------------------------------------------------------------
VOLUME FSEQ CR-DATE  CR-TIME  CR-JOB   1STVSN VSEQ USER-ID  FILE-NAME(SHORT.)
------------------------------------------------------------------------------
GRA001 0001 <date>   <time>   MAREN001 GRA001 0001 MAREN001 SAMPLE.TAPESET.1
GRA002 0001 <date>   <time>   MAREN001 GRA002 0001 MAREN001 SAMPLE.TAPESET.1
GRA003 0001 <date>   <time>   MAREN001 GRA003 0001 MAREN001 SAMPLE.TAPESET.1
GRA004 0001 <date>   <time>   MAREN001 GRA003 0002 MAREN001 SAMPLE.TAPESET.1
GRA005 0001 <date>   <time>   MAREN001 GRA003 0003 MAREN001 SAMPLE.TAPESET.1
GRA006 0001 <date>   <time>   MAREN001 GRA006 0001 MAREN001 SAMPLE.TAPESET.1
GRA007 0001 <date>   <time>   MAREN001 GRA006 0002 MAREN001 SAMPLE.TAPESET.1
GRA008 0001 <date>   <time>   MAREN001 GRA006 0003 MAREN001 SAMPLE.TAPESET.1
GRA009 0001 <date>   <time>   MAREN001 GRA009 0001 MAREN001 SAMPLE.TAPESET.1
GRA010 0001 <date>   <time>   MAREN001 GRA003 0001 MAREN001 SAMPLE.TAPESET.1
%  MARM120 TOTAL OF 10 MAREN CATALOG ENTRIES PROCESSED
```

Five versions of the SAMPLE.TAPESET.1 tape file exist on the following tapes:

– Version 0 (*LATEST) on GRA009
– Version -1 on GRA006, GRA007 and GRA008 (multivolume file)
– Version -2 on GRA003, GRA010, GRA004 and GRA005 (multivolume file); GRA003 is obsolete since it was replaced by the tape GRA010 created subsequently (see tape sequence: VSEQ=1 for both tapes)
– Version -3 on GRA002
– Version -4 on GRA001

Example 5: Output of all MAREN catalog entries for a file version

From the tapes listed in example 4, only those used to create file version -1 are to be selected:

```
//show-volume-attributes volume=*all,user-id=*all,
   file-name=sample.tape.set.1(version=-1,type-of-vol=*any)
------------------------------------------------------------------------------
VOLUME FSEQ CR-DATE  CR-TIME  CR-JOB   1STVSN VSEQ USER-ID  FILE-NAME(SHORT.)
------------------------------------------------------------------------------
GRA006 0001 <date>   <time>   MAREN001 GRA006 0001 MAREN001 SAMPLE.TAPESET.1
GRA007 0001 <date>   <time>   MAREN001 GRA006 0002 MAREN001 SAMPLE.TAPESET.1
GRA008 0001 <date>   <time>   MAREN001 GRA006 0003 MAREN001 SAMPLE.TAPESET.1
%  MARM120 TOTAL OF 3 MAREN CATALOG ENTRIES PROCESSED
```

Example 6: Output of all MAREN catalog entries for obsolete tapes

From the tapes listed in example 4, only those which have been replaced by new tapes are to be selected. Afterwards these tapes will be released:

```
//show-volume-attributes volume=*all,user-id=*all,
   file-name=sample.tape.set.1(version=-1,type-of-vol=*obs)
------------------------------------------------------------------------------
VOLUME FSEQ CR-DATE  CR-TIME  CR-JOB   1STVSN VSEQ USER-ID  FILE-NAME(SHORT.)
------------------------------------------------------------------------------
GRA003 0001 <date>   <time>   MAREN001 GRA003 0001 MAREN001 SAMPLE.TAPESET.1
%  MARM120 TOTAL OF 1 MAREN CATALOG ENTRIES PROCESSED

//mod-tape-set-attr select=*by-attr(
   file-name=sample.tapeset.1,version=*all,type-of-vol=*obs),
   prot=*par(free-date=0,expir-date=0)
%  MARM121 MAREN CATALOG ENTRY 'GRA003'/'0001' MODIFIZIERT
%  MARM120 TOTAL OF 1 MAREN CATALOG ENTRIES PROCESSED
```

Example 7:
Output of all MAREN catalog entries for a directory with a specific SAVE-FILE-ID

```
//show-volume-attributes directory-name=maren.v90b.dir(save-file-id=-0)
%  MARM195 NO DIRECT ACCESS TO MAREN CATALOG POSSIBLE
 ------------------------------------------------------------------------------
 VOLUME USER-ID  REQ-NAME DIRECTORY-NAME (SHORTENED)  SAVE-FILE-ID SUB-SV/SEQ
 ------------------------------------------------------------------------------
 QE0020 TSOS     SFID#001 :POPP:$TSOS.MAREN.V90B.DIR   S.020716.135432 00 001
 QE0021 TSOS     SFID#001 :POPP:$TSOS.MAREN.V90B.DIR   S.020716.135432 01 001
 QE0023 TSOS     SFID#001 :POPP:$TSOS.MAREN.V90B.DIR   S.020716.135432 02 001
 QE0022 TSOS     SFID#001 :POPP:$TSOS.MAREN.V90B.DIR   S.020716.135432 03 001
 QE0024 TSOS     SFID#001 :POPP:$TSOS.MAREN.V90B.DIR   S.020716.135432 03 002
%  MARM120 TOTAL OF 5 MAREN CATALOG ENTRIES PROCESSED
```

The information concerning all of the tapes contained in the last, i.e. in the most recent save file is output.

Example 8: Output of all tapes which belong to a volume group.

```
//show-volume-attributes vol=*int(sh,sh9),vol-group=EPSWOS3*
 ------------------------------------------------------------------------------
 VOLUME-GROUP NAME         VSN     FSEQ  USER-ID    FILE-/DIR-NAME(SHORTENED)
 ---- *STD-DOM ----------------------------------------------------------------
 EPSWOS3-GER               ANCA01  0001  TSOS       FILE1
 EPSWOS3-CLM               CLM020  0001  SYSMAREN  :2OS6:$SYSHSMS.DIR.123456
```

The name of the volume group is output because the volume group was selected by specifying a wildcard. The tape ANCA01 belongs to the volume group EPSWOS3-GER and the tape CLM020 to the volume group EPSWOS3-CLM.

Output in S variables

This statement supports the structured output in S variables (controlled by the STRUCTURE-OUTPUT operand). Further information on S variables is provided in the “Commands” manual [5].

Depending on the VOLUME operand, the following S variables are created:

Entry in the VOLUME operand	Abbreviated notation in table, Condition column
VOLUME=<vsn> (one tape) VOLUME=*ALL/*INTERVAL (multiple tapes)	1 2

Output information	Name of the S variable	T	Contents	Condition
Access counter (8-digit) It is incremented each time the tape is accessed.	var(*LIST).ACCESS-COUNT	S	<integer 0..99999999>	1,2
Comment field for internal information	var(*LIST).ADM-FIELD	S	<c-string 1..8>	1
Comment field for internal information	var(*LIST).ADM-FIELD-2	S	<c-string 1..16>	1
Audit flag	var(*LIST).AUDIT	S	*YES *NO	1
Check digit	var(*LIST).CHECK-COUNT	S	<integer 00..99>	1
CLOSE flag Provides information on whether creation of a tape file has been terminated correctly.	var(*LIST).CLOSE-INDICATOR	S	OPENED CLOSED	1
Catalog ID from the file name at the time of file creation. It is only supplied if F-NAME exists	var(*LIST).CRE-CAT-ID	S	<cat-id>	1
Creation date	var(*LIST).CRE-DATE	S	yyyy-mm-dd	1,2
Creation job name	var(*LIST).CRE-JOB-NAME	S	” <name 1..8>	1,2
Creation time	var(*LIST).CRE-TIME	S	hh:mm:ss	1,2
User ID from the file name at the time of file creation. It is only supplied if F-NAME exists.	var(*LIST).CRE-USER-ID	S	” <name 1..8>	1
Device name	var(*LIST).DEV-NAME	S	<c-string 1..4>	1
Device type	var(*LIST).DEV-TYPE	S	<structured-name 1..8>	1,2
Name of a directory (with catalog ID and user ID) which contains the tape.	var(*LIST).DIR-NAME	S	<filename 1..54>	1,2
Displays whether the tape contains the directory which was also saved	var(*LIST).DIR-ON-VOL	S	*NO *YES	1,2
Administration area	var(*LIST).DOMAIN	S	<c-string 1..8>	1

(part 1 of 4)

Output information	Name of the S variable	T	Contents	Condition
File expiration date	var(*LIST).EXPIR-DATE	S	yyyy-mm-dd	1
Mailing address. The EXPORT-VOLUME statement can be used here to enter an export address , a short message, a mailbox no., etc.	var(*LIST).EXPORT-ADDR	S	<c-string 1..50>	1
Export date For tapes which are not exported this catalog entry field contains a blank	var(*LIST).EXPORT-DATE	S	yyyy-mm-dd	1
Status (exported or not)	var(*LIST).EXPORTED	S	*NO *YES	1,2
File name of a tape file Without catalog ID and user ID Provided the file is not contained in a directory.	var(*LIST).F-NAME	S	<filename 1..41>	1,2
File sequence number (4-digit)	var(*LIST).F-SEQ	S	<integer 1..9999>	1,2
First archive number of the MF/MV set	var(*LIST).FIRST-VOL	S	<vsn>	1,2
Expiration date of the tape Specifies when the reservation of the tape for a user ID can be terminated.	var(*LIST).FREE-DATE	S	yyyy-mm-dd	1,2
Release location A tape is moved to this location during the clear-up run.	var(*LIST).FREE-LOCATION	S	<alphanum-name 1..8>	1,2
Name of the free tape pool in which this tape is located or in which it should be located when it is shared	var(*LIST).FREE-POOL	S	<filename 1..54> *NO *GLOBAL *TSOS	1,2
Standard location	var(*LIST).HOME-LOCATION	S	<alphanum-name 1..8>	1,2
initialization flag	var(*LIST).INIT	S	YES NO ERASE	1
Account number of the last access	var(*LIST).LAST-ACCESS-ACCOUNT	S	<alphanum-name 1..8>	1
Date of the last access	var(*LIST).LAST-ACCESS-DATE	S	yyyy-mm-dd	1,2
Name of the system with last access	var(*LIST).LAST-ACCESS-HOSTNAM	S	<alphanum-name 1..8>	1,2
Job name of the last access	var(*LIST).LAST-ACCESS-JOB-NAM	S	<name 1..8>	1
Number of the last MAREN function which accessed the tape.	var(*LIST).LAST-ACC-FUNC-FLAG	S	<integer 1..99>	1
Name of the last MAREN function which accessed the tape.	var(*LIST).LAST-ACC-FUNC-NAME	S	<alphanum-name 1..8>	1

(part 2 of 4)

Output information	Name of the S variable	T	Contents	Condition
Time of the last access	var(*LIST).LAST-ACCESS-TIME	S	hh:mm:ss	1
TSN of the last access Only as long as the tape is occupied	var(*LIST).LAST-ACCESS-TSN	S	<alphanum-name 1..4>	1
User ID of the last access	var(*LIST).LAST-ACCESS-USER-ID	S	<name 1..8>	1,2
Session number during the last access.	var(*LIST).LAST-ACC-SESSION-NR	S	<integer 001..255>	1
CLOSE date	var(*LIST).LAST-CLOSE-DATE	S	yyyy-mm-dd	1
CLOSE time	var(*LIST).LAST-CLOSE-TIME	S	hh:mm:ss	1
Block counter for the tape	var(*LIST).LAST-WRT-BLOCK-CNT	S	<integer 0..9999999999>	1
OPEN type of last access	var(*LIST).OPEN-MODE	S	INPUT OUTPUT EXTEND INOUT OUTIN SINOUT REVERSE	1
Password for access	var(*LIST).PASS	S	*NONE *YES	1,2
Registration date of the tape	var(*LIST).REG-DATE	S	yyyy-mm-dd	1
Remark field	var(*LIST).REMARK	S	<c-string 1..24>	1,2
User field which can be freely set	var(*LIST).REMARK-2	S	<c-string 1..10>	1
User field which can be freely set	var(*LIST).REMARK-3	S	<c-string 1..12>	1
Reservation counter (4-digit) Incremented with each new reservation of the tape.	var(*LIST).RESERV-COUNT	S	<integer 0..9999>	1,2
Reservation date Date on which a tape is reserved	var(*LIST).RESERV-DATE	S	yyyy-mm-dd	1,2
SAVE-FILE-ID (HSMS) or SAVE-VERSION (ARCHIVE)	var(*LIST).SFID	S	<c-string 1..15>	1,2
Number of subtask for parallel save run in HSMS	var(*LIST).SUBSAVE	S	<integer 0..15>	1,2
Number of subsequent tape within a parallel save run in HSMS	var(*LIST).SUBSEQ	S	<integer 0..999>	1,2
Current location	var(*LIST).TEMP-LOCATION	S	” <name 1..8>	1
Shareability of the tape	var(*LIST).USER-ACCESS	S	OWNER-ONLY FOREIGN-READ ALL-USERS	1,2
Account number of the tape owner	var(*LIST).USER-ACCOUNT	S	<alphanum-name 1..8>	1,2

(part 3 of 4)

Output information	Name of the S variable	T	Contents	Condition
User field. Data such as name and department or data relevant for operations scheduling can be entered here.	var(*LIST).USER-FIELD	S	<c-string 1..54>	1,2
User ID of the owner	var(*LIST).USER-ID	S	<name 1..8>	1,2
Tape VSN	var(*LIST).VOL	S	<vsn>	1,2
Volume group Only has a valid value with reserved tapes, otherwise it is undefined.	var(*LIST).VOL-GROUP	S	<text 1..32>	1,2
Volume sequence number (4-digit)	var(*LIST).VOL-SEQ	S	<integer 1..255>	1,2
Tape status	var(*LIST).VOL-STA	S	FREE PRIVATE RESERVED DEFECT	1
Tape status F = FREE P = PRIVATE R = RESERVED D = DEFECT	var(*LIST).VOL-STA-1	S	F/P/R/D	2

(part 4 of 4)

SHOW-VSNS
Show archive numbers of tapes

Privilege ADA, DA, administrator without domains

This statement displays information on the archive numbers of reserved or free tapes. Information on reserved tapes can be output on the basis of user IDs, volume groups or directories. Information on free tapes can be selected on the basis of a particular device type or its allocation to free tape pools. In addition, the selection of the tapes can be made via their assignment to a domain.

DAs can only execute the statement in their own domain. The DOMAIN operand is thus meaningless for them.

Format

SHOW-VSNS

SELECT = ***USER-ID**ENTIFICATION (...) / ***FI**LE-**NAME**(...) / ***DIR**ECTORY-**NAME**(...) /
***FREE-VOL**UMES(...) / ***VOL**UME-**GR**OUP(...)

***USER-ID**ENTIFICATION(...)
USER-IDENTIFICATION = ***ALL** / <filename 1..8 with-wild>

***FI**LE-**NAME**(...)
FILE-**NAME** = ***ALL** / <filename 1..41 without-cat-user with-wild>

***DIR**ECTORY-**NAME**(...)
DIRECTORY-**NAME** = ***ALL** / <filename 1..54 without-gen-vers>

***FREE-VOL**UMES(...)
DEVICE-**TYPE** = ***STD** / <structured-name 1..8>
,**FREE-POOL** = ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54> /
<text 2..32 without-sep>

***VOL**UME-**GR**OUP(...)
VOLUME-**GR**OUP = ***ALL** / <text 1..32 without-sep>

,**OUTP**UT = ***SYSOUT** / ***NONE**

,**STRUCTURE-OUTP**UT = ***NONE** / <composed-name 1..255> (...)

<composed-name 1..255> (...)
WRITE-MODE = ***REPLACE** / ***EXTEND**

,**DOMAIN** = ***ANY** / ***OWN** / ***STD-DOMAIN** / <alphanum-name 1..8>

,**INF**ORMATION = ***VOL**UMES / ***SUMM**ARY

Operands

SELECT =
Determines the selection criteria for the VSNs to be output and thus at the same time defines the criteria according to which the output is to be sorted.

SELECT = *USER-IDENTIFICATION(...)
The output is to be sorted according to user IDs. The output can be limited to certain user IDs.

USER-IDENTIFICATION = *ALL / <filename 1..8 with-wild>
Only the archive numbers of all tapes reserved for this user ID are output. An asterisk can also be specified as the last character of the user ID (e.g. TEST*). In this case, all archive numbers from all user IDs which begin with the character string specified (TEST) are selected. Wildcards other than “*” are not permitted.

USER-IDENTIFICATION = *ALL
The IDs are not evaluated during selection.

SELECT = *FILE-NAME(...)
The output is to be sorted according to file names. The output can be limited to certain file names

FILE-NAME = *ALL / <filename 1..41 with-wild-without-cat-user>
The archive numbers of all reserved tapes whose catalog entry contains the specified file name are listed. An asterisk can be specified as the last character of the file name (e.g. PROG*). In this case, the archive numbers for all file names which begin with the character string specified (PROG) are selected. Wildcards other than “*” are not permitted.

FILE-NAME = *ALL
VSNs are not selected on the basis of specific file names. Tapees whose catalog entry contains no file name or an ARCHIVE directory name constitute an exception.

SELECT = *DIRECTORY-NAME(...)
The output is to be sorted according to the names of directories.
The output can be limited to a certain directory.

DIRECTORY-NAME = *ALL / <filename 1..54 without-gen-vers>
Only reserved tapes which are assigned to the pool of the specified directory are selected.
If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own ID and standard catalog ID can be omitted.

DIRECTORY-NAME = *ALL
The archive numbers of all reserved tapes assigned to the pools of directories are listed.

SELECT = *FREE-VOLUMES(...)
Specifies that only the archive numbers of free tapes are to be listed.

DEVICE-TYPE =
Device type. If a directory name is specified for FREE-POOL, the DEVICE-TYPE entry is ignored.

DEVICE-TYPE = *STD
All tapes of the default device type (DEFAULT-DEVICE-TYPE) whose value was specified in the MODIFY-MAREN-PARAMETERS statement are listed.

DEVICE-TYPE = <structured-name 1..8>
Device type. For a list of possible entries (depending on the BS2000 version), see manual “System Installation” [6].

FREE-POOL =
Selects the archive entries to be made available on the basis of the free tape pool.

FREE-POOL = *NO
Only free tapes assigned to the *NO free tape pool are selected.

FREE-POOL = *GLOBAL
Only free tapes assigned to the *GLOBAL free tape pool are selected.

FREE-POOL = *TSOS
Only free tapes assigned to the *TSOS free tape pool are selected.

If aliases are specified for the *NO, *GLOBAL or *TSOS values, then these operand values will be expanded to their full length for compatibility reasons (e.g. *GL is expanded to *GLOBAL).

FREE-POOL = <filename 1..54 without-gen-vers>
Only free tapes assigned to the free tape pool for HSMS/ARCHIVE applications using the specified directory are selected. If this directory is located under a remote user ID, both the user ID and the catalog ID must be entered. The user's own ID and standard catalog ID can be omitted.

FREE-POOL = <text 2..32 without-sep>
Specifies the name of a free tape pool.
The name of the free tape pool must begin with “*” followed by at least one character from A-Z or 0-9. The characters “.”, “-” and “_” are permitted, but not at the end and not next to each other.

SELECT = *VOLUME-GROUP(...)
The output is to be sorted according to the names of volume groups.

VOLUME-GROUP = *ALL / <text 1..32 without-sep>
The archive numbers of all reserved tapes are listed which contain the specified volume groups in the archive entry. When *ALL is specified, all reserved tapes are output which are explicitly assigned to a volume group. “*” can be entered as the last character. In this case all volume groups which begin with the specified string are selected.

OUTPUT =
Determines the output medium. Output to SYSOUT is the default.

OUTPUT = *SYSOUT
Output is directed to SYSOUT.

OUTPUT = *NONE
No output takes place. This specification only makes sense for structured output in an S variable (see the STRUCTURE-OUTPUT operand).

STRUCTURE-OUTPUT =
Controls the structured output in S variables.

STRUCTURE-OUTPUT = *NONE
No structured output takes place.

STRUCTURE-OUTPUT = <composed-name 1..255>(...)
Name of the S variable to be used for the structured output.

WRITE-MODE =
Determines whether the output should replace or extend the current content of the S variables.

WRITE-MODE = *REPLACE
The current content of the S variable is replaced by the new output.

WRITE-MODE = *EXTEND
The new output extends the current content of the S variable.

DOMAIN =
Only the archive numbers of tapes from the specified domain are to be output.

DOMAIN = *ANY
The archive numbers of tapes from all domains are output.

DOMAIN = *OWN
The archive numbers of tapes from the user's own domain are output.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = *STD-DOMAIN
The archive numbers of tapes from the standard domain are output.

DOMAIN = <alphanum-name 1..8>
The archive numbers of tapes from the selected domain are output.

If domains are used, the DA is shown free tapes either from the standard domain or from his/her own domain. This is dependent on which value the domain-specific FREE-VOLUMES operand has.
The ADA is shown free tapes of the domain which is specified with the DOMAIN operand.

INFORMATION =
Defines the scope of the information to be displayed.

INFORMATION = *VOLUMES
Specifies that both archive numbers and the corresponding total number of archive numbers per user ID, file name, etc. are to be listed.

INFORMATION = *SUMMARY
Only the total number of archive numbers per user ID, file name, etc. are to be listed.

Notes

- If there are two or more catalog entries with different file sequence numbers for a given archive number , this archive number is only specified once in connection with the corresponding user ID.
- In the case of selection by file name, the archive number is also displayed in the case of a catalog entry with a file sequence number > 1.

Examples

Example 1: SYSOUT output for tapes of user IDs beginning with "SYS":

```
//show-vsns user-id=sys*
%  MARM1D1 VOLUMES FOR USER ID 'SYSDUMP' :
 MB2251
%  MARM1D6      1 VOLUMES FOR USER ID 'SYSDUMP'
%  MARM1D1 VOLUMES FOR USER ID 'SYSHSMS' :
 DRL1D6  TAR012  THS013
%  MARM1D6      3 VOLUMES FOR USER ID 'SYSHSMS'
%  MARM1D1 VOLUMES FOR USER ID 'SYSMAREN' :
 RHS002  THS014  TLS031  TLS032  TLS033  TLS034  TLS035  TLS036  TLS037
 TLS038  TLS039  TLS040  TLS041  TLS042  TLS043  TLS044  TLS045
%  MARM1D6     17 VOLUMES FOR USER ID 'SYSMAREN'
%  MARM1D1 VOLUMES FOR USER ID 'SYSROBAR' :
 T07825
%  MARM1D6      1 VOLUMES FOR USER ID 'SYSROBAR'
%  MARM1D9 TOTAL OF     22 DATENTRAEGER IM MAREN-KATALOG ENTSPRECHEN DEN
AUSWAHL-KRITERIEN
%  MARM170 STATEMENT '//SHOW-VSNS' PROCESSED
```

*Example 2: SYSOUT output for tapes sorted according to volume groups (by specifying SELECT=*VOLUME-GROUP(...)):*

```
//show-vsns select=*volume-group(volume-group=epswos3*),information=*volumes
%  MARM290 VOLUMES FOR VOLUME-GROUP 'EPSWOS3-CLM':
 CLM020  CLM021  CLM023  CLM027  CLM028  CLM205
%  MARM291      6 VOLUMES FOUND FOR VOLUME-GROUP 'EPSWOS3-CLM'
%  MARM290 VOLUMES FOR VOLUME-GROUP 'EPSWOS3-GER':
 ANCA01  ANCA02  ANCA03  ANCA04  ANCA05  ANCA06  ANCA07
%  MARM291      7 VOLUMES FOUND FOR VOLUME-GROUP 'EPSWOS3-GER'
%  MARM1D9 TOTAL OF  13 VOLUMES IN MAREN CATALOG MATCH SPECIFIED SELECTION
CRITERIA
%  MARM170 STATEMENT '//SHOW-VSNS' PROCESSED
```

The INFORMATION=*VOLUMES operand enables the archive numbers of all reserved tapes to be output which contain a volume group name beginning with EPSWOS in the catalog entry. In addition, the total number of tapes which satisfy the specified selection criterion is output.

```
//show-vsns select=*volume-group(volume-group=epswos3*),information=*summary
%  MARM291     6 VOLUMES FOUND FOR VOLUME-GROUP 'EPSWOS3-CLM'
%  MARM291     7 VOLUMES FOUND FOR VOLUME-GROUP 'EPSWOS3-GER'
%  MARM1D9 TOTAL OF  13 VOLUMES IN MAREN CATALOG MATCH SPECIFIED SELECTION
CRITERIA
%  MARM170 STATEMENT '//SHOW-VSNS' PROCESSED
```

INFORMATION=*SUMMARY outputs only the total number of tapes which contain the volume group EPSWOS3* in the catalog entry.

Output in S variables

This statement supports the structured output in S variables (controlled by the STRUCTURE-OUTPUT operand).

Further information on S variables is provided in the “Commands” manual [5].

Output information	Name of the S variable	T	Contents
Access counter (8-digit). It is incremented each time the tape is accessed.	var(*LIST).ACCESS-COUNT	S	<integer 0..99999999>
Creation date	var(*LIST).CRE-DATE	S	yyyy-mm-dd
Creation job name For HSMS request name	var(*LIST).CRE-JOB-NAME	S	” <name 1..8>
Creation time	var(*LIST).CRE-TIME	S	hh:mm:ss
Device type	var(*LIST).DEV-TYPE	S	<structured-name 1..8>
Name of a directory (with catalog ID and user ID) which contains the tape.	var(*LIST).DIR-NAME	S	<filename 1..54 >
Displays whether the tape contains the directory which was also saved	var(*LIST).DIR-ON-VOL	S	*NO *YES
Status (exported or not)	var(*LIST).EXPORTED	S	*NO *YES
First archive number of the MF/MV set	var(*LIST).FIRST-VOL	S	<vsn>
File name of a tape file Without catalog ID and user ID	var(*LIST).F-NAME	S	<filename 1..41>
Expiration date of the tape Specifies when the reservation of the tap for a user ID is terminated.	var(*LIST).FREE-DATE	S	yyyy-mm-dd
Release location. A tape is moved to this location during the clear-up run.	var(*LIST).FREE-LOCATION	S	<alphanum-name 1..8>
Name of the free tape pool in which this tape is located, or in which it should be located when it is shared.	var(*LIST).FREE-POOL	S	<filename 1..54> *NO *GLOBAL *TSOS
File sequence number (4-digit)	var(*LIST).F-SEQ	S	<integer 1..9999>
Standard location	var(*LIST).HOME-LOCATION	S	<alphanum-name 1..8>
Name of the system with last access	var(*LIST).LAST-ACCESS-HOSTNAM	S	<alphanum-name 1..8>
Date of the last access	var(*LIST).LAST-ACCESS-DATE	S	yyyy-mm-dd
User ID of the last access	var(*LIST).LAST-ACCESS-USER-ID	S	<name 1..8>
Password for access	var(*LIST).PASS	S	*NONE *YES

(part 1 of 2)

Output information	Name of the S variable	T	Contents
Comment field which should be filled with a meaningful text.	var(*LIST).REMARK	S	<c-string 1..24>
Reservation counter. This counter is incremented with each new reservation of the tape.	var(*LIST).RESERV-COUNT	S	<integer 0..9999>
Reservation date. Date on which a tape is reserved	var(*LIST).RESERV-DATE	S	yyyy-mm-dd
SAVE-FILE-ID (HSMS) or SAVE-VERSION (ARCHIVE)	var(*LIST).SFID	S	<c-string 1..15>
Number of subtask for parallel save run in HSMS	var(*LIST).SUBSAVE	S	<integer 0..15>
Number of subsequent tape within a parallel save run in HSMS	var(*LIST).SUBSEQ	S	<integer 0..999>
Shareability of the tape	var(*LIST).USER-ACCESS	S	OWNER-ONLY FOREIGN-READ ALL-USERS
Account number	var(*LIST).USER-ACCOUNT	S	<alphanum-name 1..8>
User field. Data such as name and department or data relevant for operations scheduling can be entered here.	var(*LIST).USER-FIELD	S	<c-string 1..54>
User ID of the owner	var(*LIST).USER-ID	S	<name 1..8>
Tape VSN	var(*LIST).VOL	S	<vsn>
Volume group Only has a valid value with reserved tapes, otherwise it is undefined.	var(*LIST).VOL-GROUP	S	<text 1..32>
Volume sequence number (4-digit)	var(*LIST).VOL-SEQ	S	<integer 1..255>
Tape status F = FREE P = PRIVATE R = RESERVED D = DEFECT	var(*LIST).VOL-STA-1	S	F/P/R/D

(part 2 of 2)

STOP-CONTROL-PROGRAM
Terminate MAREN control programs

Privilege ADA, DA, administrator without domains

This statement terminates the MAREN control programs MARENCP and/or MARENUCP.

If MARENCP is terminated, the MAREN catalog is also closed implicitly on the specified system. The MAREN catalog is opened automatically after MARENCP has been loaded again.

Format

STOP-CONTROL-**PROG**RAM Alias: **STCP**

PROGRAM-**NAME** = ***MARENCP** / list-poss(2): ***MARENCP** / ***MARENUCP**

,**HOST-NAME** = ***OWN** / ***ALL** / <alphanum-name 1..8> / ***ALL-FROM-DOMAIN**

***ALL-FROM-DOMAIN(...)**
DOMAIN = ***STD-DOMAIN** / ***OWN** / <alphanum-name 1..8>

Operands

PROGRAM-NAME =
Specifies which control programs are to be terminated.

PROGRAM-NAME = *MARENCP
The MAREN control program is terminated.

PROGRAM-NAME = *MARENUCP
The automatic free tape facility of MAREN is terminated.

HOST-NAME =
Specifies the systems for which a MAREN control program is to be terminated.

HOST-NAME = *OWN
A MAREN control program is only terminated for the local system.
If the ADA has used the MODIFY-ADMINISTRATION-SCOPE DOMAIN=... statement to become the DA of a domain, HOST=*OWN addresses the system which was determined by the HOST operand in the MODIFY-ADMINISTRATION-SCOPE statement.

HOST-NAME = *ALL
When domains are used, a MAREN control program is terminated for all hosts in a DA's own domain; for the ADA, the MAREN program is terminated for all systems.

HOST-NAME = <alphanum-name 1..8>
Name of a system.
If the DA enters a system name when domains are being used, this system must belong to the DA's own domain.

HOST-NAME = *ALL-FROM-DOMAIN (...)
A MAREN control program is terminated for the systems of a particular domain. This operand may only be used by the ADA.

DOMAIN =
Selects the domain.

DOMAIN = *STD-DOMAIN
A MAREN control program is terminated for the systems in the standard domain.

DOMAIN = *OWN
A MAREN control program is terminated for the systems in the local domain.
The user's own domain is the domain of the system on which the ADA is currently working.

DOMAIN = <alphanum-name 1..8>
A MAREN control program is terminated for the systems in the specified domain.

SYSTEM
Switch to BS2000 system mode

Privilege ADA, DA, administrator without domains

System commands can be entered in BS2000 system mode. MARENADM remains loaded and can be resumed again using the RESUME-PROGRAM command. The START-, LOAD-EXECUTABLE-PROGRAM (or START-/LOAD-PROGAM), and EXIT-JOB (or LOGOFF) commands, however, terminate MARENADM.

As the SDF standard statement HOLD-PROGRAM provides the same functionality, the SYSTEM statement should no longer be used in new procedures or ENTER files. In existing jobs it should gradually be replaced by the HOLD-PROGRAM statement.

Format

SYSTEM

The SYSTEM statement does not have any operands.

UPDATE-MAREN-CATALOG
Update the MAREN catalog

Privilege ADA, administrator without domains

The UPDATE-MAREN-CATALOG statement updates the MAREN catalog in the event of inconsistencies such as a defective or lost catalog or offline logging.

This statement and complete information from the logging files are used to update the MAREN catalog.

If the MAREN catalog is defective or lost, a backup version must first be read in (this may have been created with COPY-VOLUME-CATALOG). The existing MAREN catalog can be processed after offline logging.

The UPDATE-MAREN-CATALOG statement also enables information from a HSMS archive or ARCHIVE directory to be added to the MAREN catalog. In the process, entries for tapes which do not yet exist can be created, and entries for existing tapes can be updated.

Format

UPDATE-**MAR**EN-**CAT**ALOG Alias: **UPMC**

INPUT = ***BY-LOG**GING(...) / ***BY-HSMS**(...) / ***BY-ARCHIVE**(...)

***BY-LOG**GING(...)

LOGGING-**FI**LE = list-poss(99): <filename 1..54>
,**START-DATE** = **0000-01-01** / <date>
,**START-TIME** = **00:00:00** / <time>

***BY-HSMS**(...)

ARCHIVE-NAME = <filename 1..22 without-gen-vers>
,**ENVIRONMENT** = ***STD** / ***NODE-STD** / ***SINGLE-FEATURE** / ***SYSTEM-MANAGED**(...)

***SYSTEM-MANAGED**(...)

CATALOG-IDENTIFIER = <cat-id 1..4>

,**ACTION** = ***ADD**(...) / ***MOD**IFY(...)

***ADD**(...)

USER-IDENTIFICATION = <name 1..8>
,**FREE-POOL** = ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> / <text 2..32 without-sep>
,**ACCOUNT** = ***NONE** / <alphanum-name 1..8>
,**FREE-DATE** = ***STD** / <date with-compl> / <integer 0..32767>
,**HOME-LOC**ATION = **CENTRAL** / <alphanum-name 1..8>
,**FREE-LOC**ATION = **CENTRAL** / <alphanum-name 1..8>
,**TEMP**ORARY-**LOC**ATION = **CENTRAL** / <alphanum-name 1..8>
,**INIT**IALIZATION = ***Y**ES / ***NO** / ***ERASE**
,**USER-ACC**ESS = ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY / ***ALL-USERS**

***MOD**IFY(...)

USER-IDENTIFICATION = ***UNCHA**NGED / <name 1..8>
,**FREE-POOL** = ***UNCHA**NGED / ***NO** / ***GLOBAL** / ***TSOS** / <filename 1..54 without-gen-vers> / <text 2..32 without-sep>
,**ACCOUNT** = ***UNCHA**NGED / ***NONE** / <alphanum-name 1..8>
,**FREE-DATE** = ***UNCHA**NGED / <date with-compl> / <integer 0..32767>
,**EXPIR**ATION-**DATE** = ***FROM-HSMS** / ***UNCHA**NGED
,**HOME-LOC**ATION = ***UNCHA**NGED / **CENTRAL** / <alphanum-name 1..8>
,**FREE-LOC**ATION = ***UNCHA**NGED / **CENTRAL** / <alphanum-name 1..8>
,**TEMP**ORARY-**LOC**ATION = ***UNCHA**NGED / **CENTRAL** / <alphanum-name 1..8>
,**INIT**IALIZATION = ***UNCHA**NGED / ***Y**ES / ***NO** / ***ERASE**
,**USER-ACC**ESS = ***UNCHA**NGED / ***OWNER-ONLY** / ***FOREIGN-READ**-ONLY / ***ALL-USERS**

(part 1 of 2)

```
*BY-ARCHIVE(...)
    INQUIRE-LIST = <filename 1..54>
   ,ACTION = *ADD(...) / *MODIFY(...)
      *ADD(...)
            USER-IDENTIFICATION = <name 1..8>
           ,FREE-POOL = *NO / *GLOBAL / *TSOS / <filename 1..54 without-gen-vers> /
                        <text 2..32 without-sep>
           ,ACCOUNT = *NONE / <alphanum-name 1..8>
           ,FREE-DATE = *STD / <date with-compl> / <integer 0..32767>
           ,HOME-LOCATION = CENTRAL / <alphanum-name 1..8>
           ,FREE-LOCATION = CENTRAL / <alphanum-name 1..8>
           ,TEMPORARY-LOCATION = CENTRAL / <alphanum-name 1..8>
           ,INITIALIZATION = *YES / *NO / *ERASE
           ,USER-ACCESS = *OWNER-ONLY / *FOREIGN-READ-ONLY / *ALL-USERS
      *MODIFY(...)
            USER-IDENTIFICATION = *UNCHANGED / <name 1..8>
           ,FREE-POOL = *UNCHANGED / *NO / *GLOBAL / *TSOS /
                        <filename 1..54 without-gen-vers> / <text 2..32 without-sep>
           ,ACCOUNT = *UNCHANGED / *NONE / <alphanum-name 1..8>
           ,FREE-DATE = *UNCHANGED / <date with-compl> / <integer 0..32767>
           ,EXPIRATION-DATE = *FROM-ARCHIVE / *UNCHANGED
           ,HOME-LOCATION = *UNCHANGED / CENTRAL / <alphanum-name 1..8>
           ,FREE-LOCATION = *UNCHANGED / CENTRAL / <alphanum-name 1..8>
           ,TEMPORARY-LOCATION = *UNCHANGED / CENTRAL / <alphanum-name 1..8>
           ,INITIALIZATION = *UNCHANGED / *YES / *NO / *ERASE
           ,USER-ACCESS = *UNCHANGED / *OWNER-ONLY / *FOREIGN-READ-ONLY /
                          *ALL-USERS
```

(part 2 of 2)

Operands

INPUT =
Specifies what information is to be added to the MAREN catalog.

INPUT = *BY-LOGGING(...)
The MAREN catalog is to be updated from one or more logging files. The logging files of **all** systems in the MAREN network must be specified simultaneously in the statement. Only in this way can it be guaranteed that catalog entries which were processed on different systems are updated consistently. This applies in particular when offline logging entries are revised.

The two operands START-DATE and START-TIME are used to specify the tome the MAREN catalog is saved or copied and also the time when offline logging is enabled. Then only logging records which were created from this time on are taken into account. By default all logging records of the specified logging file(s) are evaluated.

LOGGING-FILE = list-poss(99): <filename 1..54>
Name of one or more ISAM files containing MAREN logging records. When multiple files are specified, the logging records are sorted automatically while processing is in progress.

START-DATE = 0000-01-01 / <date>
Start date in the format `yyyy-mm-dd`.

START-TIME = 00:00:00 / <time>
Start time in the format `hh[:mm[:ss]]`, where initial zeros need not be entered for `hh`, `mm` and `ss`.

INPUT = *BY-HSMS(...)
The MAREN catalog is to be updated with the data from an HSMS archive.

ARCHIVE-NAME = <filename 1..22 without-gen-vers>
Name of the HSMS archive.

ENVIRONMENT =
Specifies the HSMS environment in which the archive was defined.

ENVIRONMENT = *STD
The HSMS archive was defined in the standard environment for DMS archives.

ENVIRONMENT = *NODE-STD
The HSMS archive was defined in the standard environment for node archives.

ENVIRONMENT = *SINGLE-FEATURE
The HSMS archive was defined in the SF pubset environment.

ENVIRONMENT = *SYSTEM-MANAGED(...)
The HSMS archive was defined in the specified SM pubset environment.

CATALOG-IDENTIFIER = <cat-id 1..4>
Catalog ID of the SM pubset.

ACTION =
Specifies how the information is to be added to the MAREN catalog.

ACTION = *ADD(...)
The archive numbers which are contained in the HSMS archive are to be added to the MAREN catalog.

USER-IDENTIFICATION = <name 1..8>
User ID to which the tapes are assigned.

FREE-POOL =
Specifies the free tape pool to which the tapes are assigned.

FREE-POOL = *NO
The tapes are assigned to the *NO free tape pool.

FREE-POOL = *GLOBAL
The tapes are assigned to the free tape pool *GENERAL.

FREE-POOL = *TSOS
The tapes are assigned to the free tape pool *TSOS.

FREE-POOL = <filename 1..54 without-gen-vers>
The tapes are assigned to the free tape pool for HSMS/ARCHIVE applications using the directory which must be specified here. If the directory is not located under the home ID, both the user ID and the catalog ID must also be specified.

FREE-POOL = <text 2..32 without-sep>
Name of an existing free tape pool to which the tapes are assigned.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number for the user ID specified under USER-IDENTIFICATION. When *NONE is specified, no account number is noted in the catalog entry.

FREE-DATE = *STD / <date with-compl> / <integer 0..32767>
Release date. Up to this date, the tape remains reserved for the given user ID. When *STD is specified, the default expiration date entered with MODIFY-MAREN-PARAMETERS is entered.
If an integer is entered instead of a date, this number is added to the current date to calculate the release date. If the EXPIRATION-DATE contained in the input file for the relevant archive number is greater than the release date specified or calculated, the FREE-DATE field in the catalog entry is supplied with the value from EXPIRATION-DATE.

HOME-LOCATION = CENTRAL / <alphanum-name 1..8>
Location at which the tape is generally stored.
The default value is CENTRAL, i.e. the tape is located in the central archive if it is not currently being processed.

FREE-LOCATION = CENTRAL / <alphanum-name 1..8>
Location at which the tape is stored after it has been released.
The default value is CENTRAL, i.e. the tape is located in the central archive as long as it is not reserved.

TEMPORARY-LOCATION = CENTRAL / <alphanum-name 1..8>
Current location of the tape.
The default value is CENTRAL, i.e. the tape is currently in the central archive.

INITIALIZATION = *YES / *NO / *ERASE
Specifies whether the tape is to be initialized after release.
The default value is *YES, i.e. the tape must be initialized before it is reserved again. *ERASE initializes the tape and erases the tape contents up to the end of the tape.

USER-ACCESS = *OWNER-ONLY / *FOREIGN-READ-ONLY / *ALL-USERS
Specifies whether foreign user IDs have read access only to the tape (FOREIGN-READ-ONLY) or whether they have write access also (ALL-USER).
The default value is OWNER-ONLY, i.e. no access is permitted from foreign user IDs.

ACTION = *MODIFY(...)
The archive numbers of the tapes contained in the HSMS archive are to be updated in the MAREN catalog if the catalog entry already exists there.

The specifications for the USER-IDENTIFICATION, FREE-POOL, ACCOUNT, FREE-DATE, HOME-LOCATION, FREE-LOCATION, TEMPORARY-LOCATION, INITIALIZATION and USER-ACCESS operands are added to the catalog if a value other than the default *UNCHANGED is entered. For a description of this operand, see ACTION=*ADD(...).

EXPIRATION-DATE = *FROM-HSMS / *UNCHANGED
Specifies whether the expiration date of a tape from the HSMS archive should be included in the MAREN catalog entry concerned. The expiration date is included only if it is earlier than the expiration date entered in the catalog. If this is the case, the catalog entry will also indicate that the tape must be initialized before it can be reserved again for further use

INPUT = *BY-ARCHIVE(...)
The MAREN catalog is to be updated with the data from an ARCHIVE directory

INQUIRE-LIST = <filename 1..54 without-gen-vers>
Name of an ARCHIVE input file with all catalog entries of the ARCHIVE directory. This input file must be created using the ARCHIVE statement INQUIRE.

ACTION =
Specifies how the information is to be added to the MAREN catalog.

ACTION = *ADD(...)
The archive numbers contained in the ARCHIVE directory are to be added to the MAREN catalog.

USER-IDENTIFICATION = <name 1..8>
User ID to which the tapes are assigned.

FREE-POOL =
Specifies the free tape pool to which the tapes are assigned.

FREE-POOL = *NO
The tapes are assigned to the *NO free tape pool.

FREE-POOL = *GLOBAL
The tapes are assigned to the free tape pool *GENERAL.

FREE-POOL = *TSOS
The tapes are assigned to the free tape pool *TSOS.

FREE-POOL = <filename 1..54 without-gen-vers>
The tapes are assigned to the free tape pool for HSMS/ARCHIVE applications using the directory which must be specified here. If the directory is not located under the home ID, both the user ID and the catalog ID must also be specified.

FREE-POOL = <text 2..32 without-sep>
Name of an existing free tape pool to which the tapes are assigned.

ACCOUNT = *NONE / <alphanum-name 1..8>
Account number for the user ID specified under USER-IDENTIFICATION. When *NONE is specified, no account number is noted in the catalog entry.

FREE-DATE = *STD / <date with-compl> / <integer 0..32767>
Release date. Up to this date, the tape remains reserved for the given user ID. When *STD is specified, the default expiration date entered with MODIFY-MAREN-PARAMETERS is entered.
If an integer is entered instead of a date, this number is added to the current date to calculate the release date. If the EXPIRATION-DATE contained in the input file for the relevant archive number is greater than the release date specified or calculated, the FREE-DATE field in the catalog entry is supplied with the value from EXPIRATION-DATE.

HOME-LOCATION = CENTRAL / <alphanum-name 1..8>
Location at which the tape is generally stored.
The default value is CENTRAL, i.e. the tape is located in the central archive if it is not currently being processed.

FREE-LOCATION = CENTRAL / <alphanum-name 1..8>
Location at which the tape is stored after it has been released.
The default value is CENTRAL, i.e. the tape is located in the central archive as long as it is not reserved.

TEMPORARY-LOCATION = CENTRAL / <alphanum-name 1..8>
Current location of the tape.
The default value is CENTRAL, i.e. the tape is currently in the central archive.

INITIALIZATION = *YES / *NO / *ERASE
Specifies whether the tape is to be initialized after release.
The default value is *YES, i.e. the tape must be initialized before it is reserved again. *ERASE initializes the tape and erases the tape contents up to the end of the tape.

USER-ACCESS = *OWNER-ONLY / *FOREIGN-READ-ONLY / *ALL-USERS
Specifies whether foreign user IDs have read access only to the tape (FOREIGN-READ-ONLY) or whether they have write access also (ALL-USER).
The default value is OWNER-ONLY, i.e. no access is permitted from foreign user IDs.

ACTION = *MODIFY(...)
The archive numbers of the tapes contained in the ARCHIVE directory are to be updated in the MAREN catalog if the catalog entry already exists there.

The specifications for the USER-IDENTIFICATION, FREE-POOL, ACCOUNT, FREE-DATE, HOME-LOCATION, FREE-LOCATION, TEMPORARY-LOCATION, INITIALIZATION and USER-ACCESS operands are added to the catalog if a value other than the default *UNCHANGED is entered. For a description of this operand, see ACTION=*ADD(...).

EXPIRATION-DATE = *FROM-ARCHIVE / *UNCHANGED
Specifies whether the expiration date of a tape from the ARCHIVE directory should be included in the MAREN catalog entry concerned. The expiration date is included only if it is earlier than the expiration date entered in the catalog. If this is the case, the catalog entry will also indicate that the tape must be initialized before it can be reserved again for further use

Catalog update with logging files

- As the statement accesses the MAREN catalog directly, it can be executed under any user ID which has direct access to the MAREN catalog.
- The MAREN catalog is updated which has been assigned to the MARENCP task via the link name MARENCAT.
- The files specified in the LOGGING-FILE operand must have the file and record format defined for the logging files.
- Old logging files can also always be processed when the MAREN catalog is updated. To ensure that the MAREN catalog is updated properly, however, all processed logging files must be consistent. No file may be forgotten. Nevertheless, it makes sense to specify the exact time the backup copy of the MAREN catalog was produced or offline logging was switched on in order to prevent superfluous logging records from being included in processing.
- At the start of this statement, the MARENADM statement CLOSE-MAREN-FILES is issued implicitly in order to temporarily prevent all user access to the MAREN catalog. Since the CLOSE-MAREN-FILES statement only affects the local system, it must also be entered for all other systems which use the same MAREN catalog.
  Additionally, all other MARENADM program runs must be terminated if they keep the MAREN catalog open in direct access mode.
  Once the update is complete, the catalog lock set for the user's own system and for all other systems on which CLOSE-MAREN-FILES was entered must now be lifted by means of the OPEN-MAREN-FILES statement. This can also be done by specifying the HOST-NAME=*ALL operand.
- If multiple logging records exist for a catalog entry, only the most recent one is used to update the MAREN catalog. When MAREN is operating with multiple systems, it is consequently necessary that the times on the various systems be set as syncrhonously as possible.
- The logging records generated during offline logging are likewise evaluated.
- Finally, a message is issued indicating the number of catalog entries updated.
- In shared mode, for performance reasons the UPDATE-MAREN-CATALOG statement should only be executed on the system with the MAREN catalog.
- If the statement is to be executed by a remote system in the MAREN network which does not have direct access to the MAREN catalog, a connection to the system with the MAREN catalog must be set up beforehand using the SET-RFA-CONNECTION command.
- During the update procedure, no new logging records are created.

Updating the catalog from the HSMS archive or ARCHIVE directory

Tape entries from an HSMS archive or an ARCHIVE directory can be entered as new entries in the MAREN catalog or update entries which already exist there. In the case of an HSMS archive, MAREN takes over the entries directly (entry in the ARCHIVE-NAME operand). In the case of an ARCHIVE directory, the entries must be available as a file, in the form of an INQUIRE list which must be created in advance using ARCHIVE (entry in the INQUIRE-LIST operand).

*New entry (ACTION=*ADD)*

All tapes contained in the specified HSMS archive or in the ARCHIVE directory are added to the MAREN catalog (ACTION=ADD is the default setting). Information for the individual catalog entry fields is taken from the following sources:

1. HSMS archive or ARCHIVE-INQUIRE list

   The following catalog entry fields are occupied from this:

Catalog entry field	Meaning
VOLUME	Tape VSN
DEVICE-TYPE	Device type
CREATION-DATE	File creation date (from SVID if available)
CREATION-TIME	File creation time (from SVID if available)
EXPIRATION-DATE	Reservation period of the tape if SVID contains RETPD, otherwise the same value as CREATION-DATE.

2. Operand values entered by the user (or their default values)

   For the “new entry” function, the USER-IDENTIFICATION operand must be specified together with the name of the HSMS archive or ARCHIVE-INQUIRE list.

   If the reservation period of the tape specified in the HSMS archive or ARCHIVE-INQUIRE list as EXPIRATION-DATE is greater than the date specified in the FREE-DATE operand, FREE-DATE is supplied with the value from EXPIRATION-DATE.

3. Default values of MAREN

   The VOLUME-STATUS is set to RESERVED, for instance, and the catalog entry field RESERVATION-DATE is supplied with the current date.

   When domains are used, all tapes are added to the user's own domain.

If a catalog entry already exists for an archive number, MAREN checks the catalog entry fields assigned to individual operands (e.g. USER-ACCESS) to see whether they match the values specified by the user (or the default values):

- If all catalog entry fields match the specified operands (or their default values), processing continues with the next archive number. This is designed to ensure that new entry jobs can be restarted if they are aborted (restart capability).
- If, however, any of the catalog entry fields differs from the specified operands (or their default values), execution is terminated.

  As soon as the catalog entry field which was complained about has been corrected with MODIFY-VOLUME-ATTRIBUTES, this new entry can be continued with UPDATE-MAREN-CATALOG.

MAREN logs each catalog entry which is added and then outputs a totals line.

*"Modify" function (ACTION=*MODIFY)*

The catalog entries in the MAREN catalog are updated for all tapes contained in the specified HSMS archive or in the ARCHIVE-INQUIRE list.

In the case of operands with the value *UNCHANGED, the corresponding catalog entry field remains unchanged.

Execution is aborted in the following cases:

– No catalog entry exists in the MAREN catalog for a given archive number.
– The tape has a VOLUME-STATUS other than RESERVED.
– An ARCHIVE directory was specified in the FREE-POOL operand and one of the catalog entries contains a different directory name.

MAREN logs each catalog entry which is modified and then outputs a totals line.

Examples

Example 1

The MAREN catalog is updated with the information from the logging file MAREN.LOGGING:

```
//upd-mar-cat log-file=maren.logging
%  MARM118 ALL FILES OF MAREN CATALOG CLOSED
%  MARM123 03268 RECORDS READ FROM FILE 'MAREN-LOGGING'
%  MARM120 TOTAL OF 00372 MAREN CATALOG ENTRIES PROCESSED
%  MARM170 STATEMENT '//UPDATE-MAREN-CATALOG' PROCESSED

//open-maren-files
%  MARM139 MAREN CATALOG OPENED. CATALOG LOCK RESET
```

Example 2

In a data center, all three systems are interconnected in shared mode to form a MAREN network. The MAREN catalog has been destroyed as a result of a disk fault. Since the logging files have been set up on other disks, they still exist. Using the backup of the MAREN catalog from the previous day together with the logging files, an updated MAREN catalog is to be created.

After the MARENCP task is started using the MAREN catalog from the day before, the update is initiated:

```
//upd-mar-cat input=*by-log(log-file=maren.logging.system1,
   maren.logging.system2,maren.logging.system3)
```

Example 3

An input file for updating the catalog is to be created from the ARCHIVE directory ARCHIVE.DIR:

```
/assign-syslst to=lst.inquire.archive.dir
/start-archive
%  ARC0001 ARCHIVE LOADED
*inquire dir=archive.dir,list=syslst,pool
%  ARC0002 STATEMENT ACCEPTED. ARCHIVE SEQUENCE NUMBER 'A.090206.172346',
%  ARC0003 ARCHIVE STATEMENT COMPLETED
*end
%  ARC0009 ARCHIVE TERMINATED
/assign-syslst to=*primary
```

The name of the file created in this way (here LST.INQUIRE.ARCHIVE.DIR) is specified in the INQUIRE-LIST operand:

```
/start-marenadm
%//upd-maren-cat input=*by-archive(inquire-list=syslst.pool,
   action=*add(user-id=sysmaren),free-pool=*tsos,free-date=<date>)
% MARM108 MAREN CATALOG ENTRY 'ID5001'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5002'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5003'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5004'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5005'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5006'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5007'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5008'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5009'/'0001' ADDED
% MARM108 MAREN CATALOG ENTRY 'ID5010'/'0001' ADDED
%  MARM105 TOTAL OF 0010 MAREN-KATALOG-EINTRAEGE ADDED
%  MARM170 STATEMENT '//UPDATE-MAREN-CATALOG' PROCESSED
%//end
%  MARM198 MARENADM TERMINATED NORMALLY
```

VERIFY-MAREN-CATALOG
Eliminate inconsistencies in the MAREN catalog

Privilege ADA, DA, administrator without domains

This statement rectifies inconsistencies in the MAREN catalog which are cause, for instance, by system errors. All records in the MAREN catalog are read and then written to do this.

Format

VERIFY-MAREN-**CAT**ALOG	Alias: **VRMC**

The VERIFY-MAREN-CATALOG statement has no operands.

Notes

- As the statement accesses the catalog directly, it can generally be executed only under the privileged user IDs TSOS and SYSMAREN.
- If the statement is executed on a remote system that does not have direct access to the MAREN catalog, a connection to the system that imported the pubset with the MAREN catalog must be set up beforehand using the SET-RFA-CONNECTION command.
- The MAREN catalog can be updated at any time from any system. It need not be closed explicitly.
  For performance reasons, the update should, however, be initiated on a system with the MAREN catalog.

WRITE-ACCOUNTING-RECORDS
Create accounting records

Privilege ADA, DA, administrator without domains

This statement creates accounting records for billing archive services.

Accounting records are evaluated using the software product RAV.

Format

WRITE-ACCOUNTING-**REC**ORDS	Alias: **WRAR**
OUTPUT-**FI**LE = <filename 1..54> ,**FROM-DATE** = <date> ,**TO-DATE** = <date> ,**LOG**GING-**FI**LE = ***NONE** / <filename 1..54> ,**ACCOUNT-REC-FORMAT** = ***V5** / ***V4** [1]	

[1] The operand is obsolete. It can still be specified for compatibility reasons.

Operands

OUTPUT-FILE = <filename 1..54>
File name of the SAM output file for the accounting records.

FROM-DATE = <date>
Date in the format `yyyy-mm-dd`. Start date of the accounting period.

TO-DATE = <date>
Date in the format `yyyy-mm-dd`. End date of the accounting period. This must not be earlier than the date specified in FROM-DATE.

LOGGING-FILE = *NONE / <filename 1..54>
Name of the MAREN logging file.

LOGGING-FILE = *NONE
Specifies that no logging file is to be evaluated.

Example

```
//write-acc-record output=maren.acc.04,from=<date>,to=<date>,
  log-file=$archiv1.maren.log
%  MARM191 PROCESSING OF MAREN CATALOG STARTED
%  MARM193 00026 ACCOUNTING RECORDS CREATED FOR RESOURCE TYPE '430'
%  MARM193 00000 ACCOUNTING RECORDS CREATED FOR RESOURCE TYPE '431'
%  MARM193 00000 ACCOUNTING RECORDS CREATED FOR RESOURCE TYPE '432'
%  MARM170 STATEMENT '//WRITE-ACCOUNTING-RECORDS' PROCESSED
```

Accounting records are created for the accounting period and written to the output file `MAREN.ACC.04`. The logging file `$ARCHIV1.MAREN.LOG` is also evaluated so that released tapes can be charged for accordingly.

Contents of the output file:

```
H441AR    TSOS    ADMINSTR        0104200400000030042004240000430000000030          LCM001/04.2004
H441AR    SYSDUMP SYSACC          0104200400000030042004240000430000000030          MB2251/07.2002
H441AR    TSOS    ADMINSTR        2604200400000030042004240000430000000005          TST001/05.2004
H441AR    TSOS    ADMINSTR        2304200400000023042004240000430000000001          TST003/04.2004
H441AR    TSOS    ADMINSTR        1604200400000030042004240000430000000015          TST004/05.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST005/04.2004
H441AR    TSOS    ADMINSTR        1604200400000030042004240000430000000015          TST006/05.2004
H441AR    TSOS    ADMINSTR        2604200400000030042004240000430000000005          TST007/05.2004
H441AR    TSOS    ADMINSTR        1604200400000030042004240000430000000015          TST008/05.2004
H441AR    TSOS    ADMINSTR        1604200400000030042004240000430000000015          TST010/05.2004
H441AR    TSOS    ADMINSTR        2604200400000030042004240000430000000005          TST011/05.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST013/04.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST014/04.2004
H441AR    TSOS    ADMINSTR        0104200400000030042004240000430000000030          TST015/04.2004
H441AR    TSOS    ADMINSTR        1604200400000030042004240000430000000015          TST016/05.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST017/04.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST019/04.2004
H441AR    TSOS    ADMINSTR        1604200400000030042004240000430000000015          TST020/05.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST021/04.2004
H441AR    TSOS    ADMINSTR        0804200400000008042004240000430000000001          TST022/04.2004
H441AR    TSOS    ADMINSTR        2804200400000028042004240000430000000001          TST023/04.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST024/04.2004
H441AR    TSOS    ADMINSTR        2904200400000029042004240000430000000001          TST025/04.2004
H441AR    TSOS    ADMINSTR        2804200400000028042004240000430000000001          TST026/04.2004
H441AR    TSOS    ADMINSTR        0804200400000008042004240000430000000001          TST027/04.2004
H441AR    TSOS    ADMINSTR        0104200400000001042004240000430000000001          TST028/04.2004
```

10.4 MARENADM as a subroutine

The MARENADM administrator program can be called from a user program as a subroutine. For this purpose, the MAREN1U module from the SYSLIB.MAREN.<ver> library must be linked into the user program.

There are two types of MAREN subroutine:

- Interactive subroutine
- Program interface

10.4.1 Interactive subroutine

The entry point MAREN1DU is used for the interactive subroutine. This mode enables you to work with MARENADM in interactive mode in the same way as if you issued a START-MARENADM command.

MAREN1DU is called by means of the statement @PASS EXTNAME=MAREN1DU.

With the exception of the operand BATCH-PROCESSING=YES of the PRINT-VOLUME-ATTRIBUTES statement, the full range of MARENADM functions is available. The user program remains loaded. Control is returned to the user program after the MARENADM statement RETURN-TO-PROGRAM or END is issued or after abnormal termination of MARENADM.

No data transfer takes place between the calling user program and the MARENADM interactive subroutine. Only indirect data transfer is possible, e.g. using the following MARENADM statement you can create an output file which then serves as an input file in the user program.

```
//SHOW-VOLUME-ATTRIBUTES OUTPUT= &filename,...
```

When calling the subroutine, the usual register conventions must be observed:

Register 13: This register contains the address of a save area which consists of 18 words and which must be made available by the calling user program. This area is used by MAREN1U to save the registers of the calling program.

Register 14: This register contains the address of the re-entry point to the calling program.

Register 15: This register contains the entry point address of MAREN1DU.

Return information is not required unless MAREN is terminated abnormally, as all results are displayed directly in the dialog.

10.4.2 Program interface

The entry point MAREN1PS is used for the program interface. In this mode, the statements to be issued to MARENADM and all accruing data and results are exchanged between the user program and MARENADM via storage areas. There is no data communication with the system files SYSDTA and SYSOUT.

The program interface does not provide access to the full range of MARENADM functions. The following MARENADM statements may **not** be used. The statements marked with (*) are standard SDF statements, see the “SDF Dialog Interface” manual [20]:

```
//CHECK-TSOSCAT
//COPY-VOLUME-CATALOG
//DELETE-VOLUME-ENTRY
//EDIT-MAREN-PARAMETERS
//EDIT-VOLUME-ATTRIBUTES
//EXECUTE-SYSTEM-COMMAND (*)
//HOLD-PROGRAM (*)
//MODIFY-ADMINISTRATION-SCOPE
//MODIFY-SDF-OPTIONS (*)
//MODIFY-TAPE-SET-ATTRIBUTES
//REMARK             (*)
//RESET-INPUT-DEFAULTS (*)
//RESTORE-SDF-INPUT  (*)
//SHOW-INPUT-DEFAULTS (*)
//SHOW-INPUT-HISTORY (*)
//SHOW-MAREN-FILE
//SHOW-MAREN-STATUS
//SHOW-SDF-OPTIONS   (*)
//SHOW-VSNS
//STEP               (*)
//UPDATE-MAREN-CATALOG
//VERIFY-MAREN-CATALOG
//WRITE-TEXT         (*)
```

The following operand values are strictly prohibited:

```
MAREN-PASSWORD=*SECRET
PASSWORD=*SECRET
VOLUME=<vsn list>
```

Instead, the corresponding statement must be issued individually for each archive number.

The following operand values must not be used with certain statements. If these operand values introduce a structure, no operand in that structure may be used:

`OUTPUT=<filename>`
in the statements REMOVE-USER-VOLUMES, RESERVE-FREE-VOLUME, SHOW-FREE-VOLUMES, SHOW-VOLUME-ATTRIBUTES
Any output files required can be created by the calling main program from the catalog entries provided by MAREN1PS.

`SORT-MODE = *RESERVATION-COUNT / *LAST-ACCESS-DATE / *FREE-DATE`
in the statement SHOW-FREE-VOLUMES

`VOLUME=*BY-TSOSCAT`
in the statement ADD-RESERVED-VOLUME

`VOLUME=*ALL(INPUT-FILE=<filename>)`
in the statement ADD-RESERVED-VOLUME
The catalog entries must be read from the input file by the main program and the archive numbers must be added individually with ADD-RES-VOL VOLUME= <vsn>. Attributes which have no operands in ADD-RES-VOL (e.g. CREATION-DATE) can then be assigned using the MODIFY-VOLUME-ATTR statement.

`INIT-FILE=<filename>`
in the statement FREE-VOLUMES
If an output file is to be created, INIT-FILE=*DUMMY must be specified. The MAREN catalog entries passed to the archive area by MAREN1PS must be output to a SAM file by the main program.

`INIT-FILE=<filename>`
in the statement INITIALIZE-VOLUMES

`VOLUME=*BY-FILE`
in the statements EXPORT-VOLUME, FREE-VOLUMES, RETURN-VOLUMES

`VOLUME=*BY-INPUT-FILE`
in the statement MODIFY-VOLUME-ATTRIBUTES
The main program must read the catalog entries from the input file, extract the archive number and the file sequence number, and supply these as values for the VOLUME and FILE-SEQ operands of the MODIFY-VOLUME-ATTRIBUTES statement.

`VERSION=*LATEST / <integer -9999..0> / *NOT-CREATED`
in the statement SHOW-VOLUME-ATTRIBUTES

`TYPE-OF-VOLUMES=*VALID / *OBSOLETE`
in the statement SHOW-VOLUME-ATTRIBUTES

`BATCH-PROCESSING=*YES`
in the statement PRINT-VOLUME-ATTRIBUTES

`UPDATE=*TEMPORARY / *PERMANENT`
in the statement PRINT-VOLUME-ATTRIBUTES
This applies to the UPDATE operand in each of the structures SELECT, SORT, and LAYOUT-CONTROL.

`MESSAGE-DESTINATION=*PRINTER / *FILE`
in the statements RETURN-VOLUMES, SECURE-FREE-VOLUMES

`NUMBER-OF-VOLUMES > 1`
in the statements RESERVE-FREE-VOLUME, SECURE-FREE-VOLUMES
This operand is not evaluated. As a rule, only a tape is processed. Otherwise the statement must be entered more than once.

`SAVE-FILE-ID <> *ALL`
in the statements

10.4.3 Data transfer areas

The user program must have three storage areas for data transfer when the MARENADM program interface MAREN1PS is called:

- Statement area (maximum of 1014 bytes)

  Here the user program must provide a MARENADM statement in the form of a variable-length record (record length field of 4 bytes) using the usual BS2000 format. The statement can be written with or without the two slashes. The statement area must be aligned on a halfword boundary.

- Catalog entry area (1014 bytes)

  In this area, MAREN transfers either a complete catalog entry or merely the catalog entry fields RETFLAG and ERRORKEY to the user program, depending on the statement. The individual catalog entry fields can be symbolically addressed via the Dsect MARENA or the copy element MARENAC.

  The catalog entry is returned either in V8 format (1014 bytes). (The secondary index area of a catalog in V8.1 format is not supported at the program interface).

- Parameter set area (672 bytes)

  In this area, the user program receives the complete parameter set output by the SHOW-MAREN-PARAMETERS statement. The individual fields may be addressed symbolically via the Dsect MARENP or the copy element MARENPL. This area must also be provided for every other statement, since MAREN1PS requires it as an internal work area.

When calling the program interface, the contents of the catalog entry and of the parameter set area are of no significance.

The MARENA macro generates a DSECT for symbolic address of the individual catalog entry fields. The MARENP macro generates a DSECT for symbolic addressing of the individual fields of the MAREN parameter set. The two macros (MARENAC and MARENPL) are contained in the SYSLIB.MAREN.<ver> library. If the operand MF=L is specified in the macro call, a data area is created with the same length as the catalog entry or the parameter set with field designations identical to the names in the relevant DSECT.

The COPY statement can be used to copy the source element MARENAC into a COBOL source program. MARENAC defines the MAREN catalog entry. The COPY statement can be used to copy the source element MARENPC into a COBOL source program. MARENPC defines the MAREN parameter set. The two copy elements (MARENAC and MARENPL) are also contained in the library SYSLIB.MAREN.<ver>.

Once a statement has been executed, MAREN1PS automatically reverts to the user program. The RETURN-TO-PROGRAM statement is therefore superfluous in this case. The END statement closes the MAREN files if they were opened in direct access mode.

Specification of a number range, which is possible for some statements using the operand VOLUME=*INTERVAL(FROM=..., TO=...,FSEQ=...), is also supported by the program interface. However, only the first applicable catalog entry is processed, after which control is immediately passed back to the caller. If necessary, the user program must repeat the statement in a loop, each time setting the start of the number range (FROM operand and FROM-FSEQ operand) to the last VSN obtained and incrementing FSEQ. Please note the following when incrementing FSEQ: if only one catalog entry per VSN is to be processed, FSEQ must be set at 9999. If, however, all available FSEQ entries are to be processed for each VSN, FSEQ must be incremented by 1 except if FSEQ=*001 (see example on page 480).

Return codes

After each return from the MARENADM program interface MAREN1PS, the user program must inspect the return information in the catalog entry field RETFLAG. Only when RETFLAG=A applies has the statement been executed normally.
RETFLAG=E means that no hits were made in the specified number range.
For all other RETFLAGs, additional return information in the catalog entry field ERRORKEY must be evaluated. This field contains the seven-digit message code of the message otherwise output to SYSOUT by the MARENADM program.

RETFLAG may be set to the following values:

RETFLAG	Meaning
A	The statement was executed without errors.
D	A DMS error occurred while accessing a file. The name of the specified file is contained in the catalog entry field FILENAME. The DMS error code is contained in the catalog entry field ERRORKEY.
E	No hit was found within the specified number range
I	Invalid entry.
L	Logical error, e.g. an attempt was made to export a tape which has already been exported.
M	Internal error in MAREN; the exact cause of the error is shown in the catalog entry field ERRORKEY.
N	The specified VSN does not exist in the MAREN catalog.
O	The MAREN administrator has activated offline logging; as a result, access to the MAREN catalog is not possible.
P	The catalog entry was simultaneously modified by another task; the statement must therefore be repeated.
S	Access to another system via MSCF was not successful.
T	The tape is still reserved by another task in the same system.
V	The tape has not yet been released by another task in another system, i.e. the internal MAREN access lock on this tape still exists.
X	The request was rejected by the MAREN administrator via a exit routine.
0	The console message MAR0085 was acknowledged by the operator with tsn.0.
2	The console message MAR0085 or MAR0086 was acknowledged by the operator with tsn.2.

The following registers must be loaded to enter the subroutine:

Register 1: This register contains the address of an operand list with a length of three words:
First word: Address of the statement area
Second word: Address of the archive record area
Third word: Address of the parameter set area

Register 13: This register contains the address of a save area which consists of 18 words and which must be made available by the calling user program. This area is used by MARENADM to save the registers of the calling program.

Register 14: This register contains the address of the re-entry point to the calling program.

Register 15: This register contains the entry point address of MAREN1PS.

10.4.4 Integrating MARENADM as a subroutine

If MARENADM is to be used as a subroutine, a linkage module which loads a module from the SYSLNK file has to be included in the main program.

This MAREN linkage module is stored in the SYSLIB.MAREN.<ver> file as an object module (OM) with the name MAREN1U , and is assigned the entry MAREN1PS when MARENADM is used as a program interface or MAREN1DU when it is used as an interactive subroutine.

The linkage module performs the following activities:

- It determines the MAREN version to be loaded dynamically.
  If the user did not specify a particular MAREN version with SELECT-PRODUCT-VERSION before calling his/her main program, the most recent version installed in the system is selected.
- The names of the SYSLNK and SYSREP flies are determined, taking due account of the version.
- These names are used to complete the BIND parameter list for loading the relevant prelinked MAREN module dynamically.

Error situation

If an error occurs while the file names are being ascertained, the default names of the MAREN version for which the linkage module was supplied are used for dynamic loading.

10.4.5 Examples

Modifying catalog entries

The following example shows the structure of an Assembler main program. The macro calls for structured programming with ASSEMBH (e.g. @IF) are not supported by ASSEMBH-BC (see the “ASSEMBH” manual [2]).

All reserved tapes with a archive numbers in the range ABC001 to ABC099 are to be made shareable without restrictions (USER-ACCESS=ALL-USERS).

Structure of the Assembler main program

```
          :
          @CYCLE
MODIFY    DS    0H
          :
           @PASS EXTNAME=MAREN1PS,PAR=PAR1PS Aufruf MARENADM
          @CAS2 RETFLAG,COMP=CLI          CHECK RETURN FLAG
          @OF   RETFLAGA                  RETURN FLAG 'A' = OK
          MVC   ANWVSN,ARCHIVNR           SET VSN IN STATEMENT
          @IF   EQ                        SET NEXT FSEQ IN STATEMENT
          CLC   FSEQ,=C'*001'             SUPPRESSED VOLUME?
          @THEN
          MVC   ANWFSEQ,=C'0001'          IF YES - NEXT FSEQ = '0001'
          @ELSE
          PACK  DOWO,FSEQ                 OTHERWISE ADD 1 TO FSEQ
          AP    DOWO,=PL1'1'
          UNPK  ANWFSEQ,DOWO+5(3)
          OI    ANWFSEQ+3,X'F0'
          @BEND
          @OF   RETFLAGE                  RETFLAG 'E' = NO MORE ENTRIES
          :
          @OFRE                           ERROR EXIT
          :
@BEND
          @BEND
          :
DOWO      DS    D                         WORKAREA
STMT      DC    Y(STMTEND-STMT)         AREA FOR MARENADM STATEMENT
          DC    CL2' '
          DC    C'//MOD-VOL-ATTR VOL=*INT(FROM='
ANWVSN    DC    CL6'ABC001'
          DC    C',FROM-FSEQ='
ANWFSEQ   DC    CL4'0001'
          DC    C',TO=ABC099),'
          DC    C'SELECT=*RES,PROT=PAR(USER-ACCESS='
          DC    C'*ALL-USERS)'
STMTEND   EQU   *
          :
          DS    0F
PAR1PS    DS    0F
          DC    A(STMT)
          DC    A(MARENA)
          DC    A(MARENP)
          :
          MARENA MF=L,LAYOUT=V8           AREA FOR MAREN CATALOG ENTRY
          MARENP MF=L                     AREA FOR MAREN PARAMETER RECORD
          :
```

Cyclical relocation of tapes

This example illustrates a more complex application of the MARENADM program interface.

Objective

Certain tapes in a data center are to be moved to a different location at specific intervals. For example, tapes from a backup are to remain on the system for a few days after they have been created (so that users can draw on them in order to restore files) and then transported to a fireproof cellar.
As MAREN is not equipped with a special statement to deal with this delayed tape transfer contingency, this problem must be solved with the aid of the MARENADM program interface.

Possible approaches

The information on the relocation cycle should be stored in an catalog entry field where it can subsequently be queried.

It can be stored by means of a MAREN exit (see chapter “MAREN exits” on page 199). It makes sense to use a exit that is called at a time when the tape has already been written to, i.e. not a reserve-request exit for example, as it is not certain in this case whether the tape is really available for use again when the exit is called.

In this context, the modify-request exit seems suitable. If this is called in the course of DMS close processing (LAFUNKNM=MAREN0C1) or in the case of tape swapping (LAFUNKNM=MAREN0E1), writing to the tape is completed. It is then possible to consult the catalog entry and check, using your own criteria, whether the tape that has just been created is to be stored at a series of different locations one after the other until it is released.

Possible criteria here (accompanied by the corresponding catalog entry fields in brackets) are:

- user ID under which the tape was created (CRUSERID if system-specific parameter CIDUID is set, otherwise also LAUSERID)
- name of the creation job (CRJOB)
- file name (FILENM41)
- name of the ARCHIVE directory with which the backup was performed (DIRNAME)

The steps involved in tape relocation may take up a great deal of space. For this reason, the catalog entry field selected to accommodate this information should be as large as possible. Furthermore, it must not be a catalog entry field that is updated by MAREN in the course of DMS access, as the information required for relocation would be lost.

The most suitable catalog entry field in this context is the USERFELD catalog entry field, which is really intended for entering user-specific data. This field can be modified by means of the USER-FIELD operand even in several MAREN or MARENADM statements, although MAREN users can only make changes to cataog entries of their own user ID (even in the case of tapes which are shareable without restrictions).
Since the value range for the USER-FIELD operand corresponds to the data type “c-string”, it may only contain printable characters. Otherwise, smudge characters will be displayed for SHOW-VOL-ATTR VOL=<vsn> in the screen mask.

Suggested solution

The 54-byte catalog entry field USERFELD in the catalog entry is divided up as follows:

6 bytes: C'CYCLE' indicating that the tape must be relocated cyclically.

48 bytes: 4 relocation statements of 12 bytes each.
These are in turn broken down as follows:

- 4 bytes: Number of days after the creation date (CRDATE) when the next relocation is to be performed.
- 8 bytes: Location to which the tape is to be moved during the next relocation.

Example

```
USERFELD=CL54'CYCLE 0028CENTRAL  0090TRESOR   0365DVBUNKER'
```

Starting from the creation date in each case, the tape is to be

– stored in the central archive after 28 days
– stored in a special safe after 90 days
– stored in a specially secure underground room after 365 days

No provision is made for a fourth storage location. On release, the tape is returned to the location specified for FREE-LOCATION.

Program implementation

With the aid of a main program which calls the MARENADM program interface, all MAREN catalog entries are read and the USERFELD catalog entry field is evaluated. If this field contains the previously written relocation entries, a check is carried out as to whether the time that has elapsed since file creation warrants a relocation. If so, the MARENADM statement MODIFY-VOLUME-ATTRIBUTES is used to modify the catalog entry field HOME-LOCATION to the location specified in the first relocation entry. This means that a relocation request for this tape will be issued the next time the MAREN administrator starts a clear-up run (MARENADM statement RETURN-VOLUMES).

Whenever a modification is made, the relocation entry that has just been processed is deleted (in order to keep the program simple) by shifting the remaining relocation entries forward.

If this program is run daily or at least before every clear-up run carried out by the MAREN administrator, it is ensured that the desired tape transfers are actually taking place (provided the relocation requests are dealt with by the appropriate personnel).

Structure of the Assembler main program

```
PSCYCLE CSECT
          :
         @CYCLE
READCAT  DS    0H    Read volume catalog sequentially
*
         MVC   STMTAREA,BLANKS
         MVC   STMTAREA,SHOWSTMT           Set statement area
         @PASS EXTNAME=MAREN1PS,PAR=STMTAREA  Call MARENADM
         @WHEN NE                          Query return code
         CLI   RETFLAG,RETFLAGA             Everything OK?
         @BREA                             Error occurred or
*                                          end-of-file reached
*
*
CHECKUF  DS    0H    Check USERFELD (CYCLE)
*
*              Do the first 6 bytes of USERFELD contain the
*                    character string C'CYCLE '?
*              No: Position to the next archive entry ( -> POSIT)
*              Position to the first relocation entry
*
*
CHECKUF2 DS    0H    Check USERFELD (relocation entries)
*
```

```
*              Do the first 4 bytes contain a numeric value?
*              No: Position to next archive entry (->POSIT)
*              Do the next 8 bytes contain a possible location,
*                    i.e. are we dealing with a character string
*                    of type <alphanumeric>, possibly filled
*                    to the right with blanks?
*              No: Position to the next archive entry (->POSIT)
*              Does USERFELD contain another entry, i.e.
*                    neither end of USERFELD reached nor the
*                    next 12 bytes all blanks?
*              Yes : Position to the next relocation entry;
*                    repeat CHECKUF2
*
*
CHECKDAT DS    OH   Check the relocation date
*
*              Add number from relocation entry to  CRDATE
*              Calculated number >= current date?
*              No: Position to next archive entry (->POSIT)
*
*
MODIFY   DS    OH   Modify the archive entry
*
         MVC   MODVSN,ARCHIVNR             VSN from archive entry
         MVC   MODFSEQ,FSEQ                FSEQ from archive entry
         MVC   MODHOMEL,USERFELD+10        Location from USERFELD
         MVC   STMTAREA,BLANKS
         MVC   STMTAREA,MODSTMT            Set statement area
         @PASS EXTNAME=MAREN1PS,PAR=STMTAREA  Call MARENADM
         @WHEN NE                          Query return code
         CLI   RETFLAG,RETFLAGA             Everything OK?
         @BREA                             Error exit
*
*
SHIFT    DS    OH   Update USERFELD
*
         MVC   SAVELOC,USERFELD+6          Save relocation statements
         MVC   USERFELD+6(48),BLANKS       Delete old contents
         MVC   USERFELD+6(36),SAVELOC+12    Undo last relocation statement
*                                          executed
*
*
POSIT    DS    OH   Position to next archive entry
*
         MVC   SHOWFROM,ARCHIVNR           VSN from archive entry
         IF    EQ
         CLC   FSEQ,=CL4'*001'             Migrated volume?
         @THEN
```

```
         MVC   SHOWFRFS,=CL4'0001'
         @ELSE
         PACK  DOWO,FSEQ
         AP    DOWO,=PL1'1'                Increment FSEQ by 1
         UNPK  SHOWFRFS,DOWO+5(3)
         OI    SHOWFRFS+3,X'F0'
         @BEND
         @BEND                             Run through loop again
         .
         .
         .
*               Constant area
         .
         .
         .
         MARENA MF=L,LAYOUT=V8             Area for archive entry
         MARENP MF=L                       Area for MAREN parameters
          .
          .
          .
STMTAREA DS    CL80                        Area for MARENADM statement
*
SHOWSTMT DC    Y(SHOWENDE-SHOWSTMT)        Statement for reading
         DC    CL2' '
         DC    C'//SHOW-VOL-ATTR VOL=*INT(FROM='
SHOWFROM DC    CL6'*FIRST'
         DC    C',FROM-FSEQ='
SHOWFRFS DC    CL4'0001'
         DC    C')'
SHOWENDE EQU   *
*
MODSTMT  DC    Y(MODENDE-MODSTMT)          Statement for modifying
         DC    CL2' '
         DC    C'//MOD-VOL-ATTR VOL='
MODVSN   DS    CL6
         DC    C',F-SEQ='
MODFSEQ  DS    CL4
         DC    C',LOCATION=*PAR(HOME-LOC='
MODHOMEL DS    CL8
         DC    C')'
MODENDE  EQU   *
*
DOWO     DS    D
SAVELOC  DS    4*CL12                    Save area for relocation entry
BLANKS   DC    CL80' '
          :
         END
```

10.5 Enhancing performance by direct access

The MARENADM administrator program contains a special access routine to enhance performance. Normally, the MAREN catalog is not accessed directly, but indirectly via the MARENCP control program. This access routine, however, attempts to open the catalog in shared update mode.
If successful, all file accesses are performed directly. If the attempt is not successful, the message `MARM195` is issued and all catalog accesses are directed as usual via the control task.

In the former case, there are two advantages:

- The response times of MARENADM are shortened.
- The load on the control task is relieved, thus improving the performance of MAREN.

The access routine can only be activated if the following prerequisites are satisfied:

- The MAREN catalog files must be opened with SHARED-UPDATE= YES by the control task; see section “Start files for MARENCP” on page 42. This also applies to the logging file if logging is activated.
- The BS2000 file protection attributes must permit opening of the MAREN catalog. This requirement is fulfilled on the system by default with the MAREN catalog if the MARENADM program is called under the user ID TSOS or under the user ID of the MAREN catalog, and any file passwords have been specified. If the access routine is also to be effective under other user IDs, special control measures are required (e.g. the catalog should be assigned the attribute USER-ACCESS=ALL-USERS and a password).
- Any module library containing exit routines which was assigned in the control program start procedure must be accessible if a read exit (module name MARENEX5) or one of the two modify exits (MARENEX2 or MARENEX4) is stored there.

The access routine can also be used from a remote system in the MAREN network which has no direct access to the MAREN catalog if an appropriate SET-RFA-CONNECTION command was entered before calling MARENADM.

11 Application examples for MARENADM

11.1 Adding new tapes

A delivery of 100 tapes of the type TAPE-U4 and 50 tapes of the type TAPE-U5 has arrived.

The tapes of the type TAPE-U5 are for a real archive system assigned to the location AML001.

The tapes of the type TAPE-U4 are for the archive system ETERNUS CS.

The new tapes are labeled with the consecutive archive numbers TU4001 through TU4100 and TU5001 through TU5050 and then added to the MAREN catalog by means of the following two statements:

```
//add-free-volumes *interval(from=tu4001,to=tu4100),device-type=tape-u4
%  MARM108 CATALOG ENTRY TU4001/0001 ADDED TO MAREN CATALOG
...
%  MARM108 CATALOG ENTRY TU4100/0001 ADDED TO MAREN CATALOG

//add-free-volumes *interval(from=tu5001,to=tu5050),device-type=tape-u5,
   free-location=aml001
%  MARM108 CATALOG ENTRY TU5001/0001 ADDED TO MAREN CATALOG
...
%  MARM108 CATALOG ENTRY TU5050/0001 ADDED TO MAREN CATALOG
```

The tapes have been added to the MAREN catalog. For HOME-LOCATION and FREE-LOCATION, MAREN takes the value specified in the ADD-FREE-VOLUMES statement. CENTRAL is entered initially for TEMPORARY-LOCATION for all tapes. Once 50 tapes of the type TAPE-U5 have been added to the archive system, ROBAR causes the storage location of the archive system (AML001) to be entered for TEMPORY-LOCATION.

11.2 Adding existing tapes

A real archive system contains 100 tapes of the type TAPE-U4 that are used by TSOS applications on a system without MAREN. The tapes are labeled with the consecutive archive numbers ROB001 through ROB100. Location AML001 is assigned to the archive system.

Once MAREN is available on the system, these tapes are to be added to the MAREN catalog. They are to remain reserved for the TSOS user ID until the specified date. The following statements are required for this purpose:

```
//add-reserved-volume volume=rob001(user-id=tsos,prot=*par(free-date=<date>),
   location=*par(home-loc=aml001,free-loc=aml001,temp-loc=aml001),
   device-type=tape-u4)
//add-reserved-volume volume=rob002(user-id=tsos,...)
```

11.3 Working with foreign tapes

Three tapes of the type TAPE-U5 have arrived and are to be loaded into the archive system with the location AML001. The files of the tapes are to be read in under the user ID TSOS. They are entered in the MAREN catalog by means of the following statement:

```
//import-foreign-volume volume=(swn050,swn051,swn052),user-id=tsos,
   device-type=tape-u5

//modify-volume-attributes volume=*interval(from=swn050,to=swn052),
   location=*par(home-loc=aml001)
```

As soon as the tape are loaded into the archive system, the location AML001 is entered as TEMPORARY-LOCATION.

Once the contents of the tapes have been copied to local tapes, the other tapes are to be sent back:

```
//export-volume vol=*int(swn050,swn051,swn052),exp-addr='remote Data Center'
```

This statement causes the archive system to unload the tapes and delete the catalog entries from the MAREN catalog. The tapes can be taken from the input/output unit and sent back.

11.4 Replacing tapes

Ten tapes (archive numbers SWN050 through SWN059) have been written in the local data center and are to be sent to the remote data center. The tapes are at a manually operated location. The tapes are exported:

```
//export-volume volume=*interval(from=swn050,to=swn059),
   exp-addr='remote Data Center'
```

As soon as the tapes have been returned from the remote data center, they are imported:

```
//import-volume volume=*interval(from=swn050,to=swn059)
```

If the tapes are assigned to a real archive system, the IMPORT-VOLUME statement is executed implicitly when the tapes are added to the archive system.

11.5 Setting up a location

A location is set up in two steps. The following example shows how the location AML001 is set up for a real archive system:

```
//modify-maren-parameters
   location-entries=*par(loc-name=aml001,action=*add(operating-mode=robar-1))
```

In order to be able to use the tape drives of the archive system, their assignment to the location AML001 must be defined in the BS2000 device management:

```
/add-device-depot unit=(a0,a1,a2),location=aml001
```

11.6 Operating free tape pools

To enter free tapes in the MAREN catalog and assign them to the free tape pool *GLOBAL:

```
//add-free-volumes volume=*int(swn050,swn059),free-pool=*global
```

To relocate tapes from one free tape pool to another free tape pool:

```
//modify-volume-attributes volume=abc,
   select=*free(free-pool=dir1,new-free-pool=*tsos)
```

To assign a reserved tape to a free tape tape tape pool and subsequently release the tape:

```
//modify-volume-attributes vol=xyz,select=*reserved(new-free-pool=*no)
//free-volumes vol=xyz
```

To enter a free tape in the MAREN catalog and assign it to the local free tape pool:

```
//add-free-volumes volume=mine,free-pool=mypool
```

11.7 Moving tapes to a different location

The tapes ARC100 through ARC120 are in an archive system (the location AML001). They have been used by HSMS for long-term archiving and are to be kept in a fire-resistant archive (FIREBALL location). They are moved to the fire-resistant archive by means of the following statements:

```
//modify-volume-attributes volume=*interval(from=arc100,to=arc120),
   location=*par(home-loc=fireball)

//return-volumes volume=*interval(from=arc100,to=arc120),to-location=fireball
```

Once the RETURN-VOLUMES statement has been processed, the tapes can be taken from the input/output unit of the archive system. At the console, a message that must be acknowledged is output for each tape. This message is acknowledged by ROBAR-CL after the tape has been exported. In addition, MARENADM issues the message MAR4164 to the output medium specified in the MESSAGE-DESTINATION operand

11.8 Releasing tapes

If the number of free tapes goes below the planned minimum number, the MAREN administrator must either obtain new tapes for the computer center or release reserved tapes again that have reached the release date.

The following example indicates the procedure for tapes of the type TAPE-U5 of an archive system (the location AM001).

The MAREN administrator regularly checks the number of free tapes:

```
//show-free-volumes volume=*all,free-location=aml001,dev-type=tape-u5
```

If the number of free tapes goes below the planned minimum number, the MAREN administrator tries to release tapes:

```
//free-volumes volume=*all,init-file=aml001.
   init-file(init-location=aml001,user-id=sysoper1),home-location=aml001
```

This statement selects all tapes with the attribute INIT=*YES. Because a file is specified in the INIT-FILE operand, the affected tapes are assigned to a special user ID (SYSOPER1 in the example; the default is the user ID SYSMAREN) rather than being released. The tapes are released in the initialization run:

```
//initialize-volumes init-file=aml001.
   init-file(init-location=aml001,user-id=sysoper1),dev-type=tape-u5
```

12 MARENEKM administrator program

The encryption key administrator uses the MARENEKM (MAREN Encryption Key Manager) administrator program for managing the encryption keys which enable the hardware feature “tape encryption” of LTO drives to be used in BS2000. “Tape encryption” is available of the type LTO-4 and higher. Encryption and decryption on the drive provides data protection at tape level and protects tape contents from being read by unauthorized persons, above all when outside the protecting data center. Encrypted tapes which are stolen or lost while being transported, stored externally in fire protection facilities or exported are thus protected against their contents being misused.

A user with the privilege TAPE-KEY-ADMINISTRATION is the encryption key administrator. He uses MARENEKM to manage only encryptions keys which are in his/her own domain. To manage another domain, the encryption key administrator must log in on a system which belongs to the specified domain.

MARENEKM statements which refer to encryption keys or key boxes can be issued simultaneously within the domain for one, more than one or all systems in the domain. Ideally the key boxes can consequently have identical contents. A prerequisite for this is that all systems in a domain belong to an MSCF cluster. If this is not the case, MARENEKM reacts as follows:

- The statement is not executed for a system which (temporarily) does not belong to the same MSCF cluster as the system on which the statement was entered. The user receives a message to this effect and must repeat the action for the system concerned.
- Systems which do not belong to the home domain are not served.

Key boxes are permanently linked to the associated domain. It is not possible to use a key box which has been obtained without authorization in a foreign domain.

12.1 Starting and terminating

The MARENEKM program is started using the START-MARENEKM command.

The START-MARENEKM command can be issued under any user ID which has been configured with the privilege TAPE-KEY-ADMINISTRATION. The SYSMAREN user ID has this privilege. If the software product SECOS is being used, any user ID can be assigned the TAPE-KEY-ADMINISTRATION privilege.

START-MARENEKM	Alias: **MARENEKM**
VERSION = ***STD** / <product-version mandatory-man-corr> / <product-version mandatory-man-without-corr> / <product-version without-man-corr>	
,**MONJV** = ***NONE** / <filename 1..54 without-gen-vers>	
,**CPU-LIM**IT = ***JOB-REST** / <integer 1..32767>	

VERSION =
The MARENEKM version selected is used.

VERSION = *STD
Before MARENEKM is called, the version is set using the SELECT-PRODUCT-VERSION command (in system mode). This set version is used as the default version.

VERSION = <product-version mandatory-man-corr>
Full version identifier.

VERSION = <product-version mandatory-man-without-corr>
Version identifier excluding the correction status.

VERSION = <product-version without-man-corr>
Version identifier excluding the release and correction status.

MONJV =
Specification of a job variable for monitoring the MARENEKM run.

MONJV = *NONE
A monitor job variable is not used.

MONJV = <filename 1..54 without-gen-vers>
Explicit specification of the job variable for monitoring the MARENEKM run.

CPU-LIMIT =
Maximum CPU time in seconds allocated for the program.

CPU-LIMIT = *JOB-REST
The remaining CPU time is to be used for the job.

CPU-LIMIT = <integer 1..32767 *seconds*>
Only the specified time is to be used.

Terminating MARENEKM

MARENEKM is etrminated by entering the END statement.

12.2 MARENEKM in interactive mode and in batch mode

MARENEKM can be run in either interactive or batch mode.

MARENEKM expects to receive all statements from the system file SYSDTA. SYSDTA is assigned to the terminal during interactive operation, and to the ENTER file during batch operation.

If MARENEKM is to be invoked in a procedure, the system file SYSDTA must be assigned with `//ASSIGN-SYSDTA TO=*SYSCMD`.

Error handling in procedures and batch jobs

Information on the progress of a MARENEKM request is stored in task switches in procedures and batch jobs. MAREN sets the task switches during execution or when execution has been concluded.

Task switch 30 is set if MARENEKM has executed a statement with a warning. Warnings are issued if, for example, an attempt is made to enter an encryption key which already exists in the key box.
If a job is distributed to multiple systems, a warning is issued if the job is executed without error on at least one of the systems.

Task switch 31 is set if MARENEKM aborts or fails to execute a statement because of an error. This happens, for example, if the specified key box does not exist. If a job is distributed to multiple systems, an error is issued if an error is reported to all systems.

If MARENEKM rejects a statement because of a syntax error, or if the statement is aborted or not executed due to a processing error, the spin off is triggered.

12.3 MARENEKM statements

Overview

MARENEKM statements	Meaning
ADD-ENCRYPTION-KEY	Enter an encryption key in the key box
COPY-ENCRYPTION-KEYS	Copy encryption keys to another key box
CREATE-ENCRYPTION-KEY	Generate an encryption key
DELETE-KEY-BOX	Delete a key box
EXPORT-KEY-BOX	Generate a transfer key box
IMPORT-KEY-BOX	Import a transfer key box
MODIFY-VOLUME-ENCRYPTION-ATTR	Update encryption attributes
REMOVE-ENCRYPTION-KEYS	Remove encryption keys from the key box
REPAIR-KEY-BOX	Repair a key box
SET-WRITE-ENCRYPTION-KEY	Define the encryption key for encryption
SHOW-ENCRYPTION-KEYS	Display the encryption keys of a key box
SHOW-VOLUME-ENCRYPTION-ATTR	Display encryption attributes of encrypted tapes

The standard SDF statements which are always available are not described (see the manual “SDF Dialog Interface” [20]).

ADD-ENCRYPTION-KEY
Enter an encryption key in the key box

Privilege Encryption-Key-Administrator

This statement enters an existing encryption key which was created using CREATE-ENCRYPTION-KEY in the key boxes of the specified systems. If the key box does not yet exist on one of the specified systems, it is created there.

An encryption key can, for example, be entered later for the following reasons:

- The key box is to be reconstructed.
- The encryption key is missing in the key box of a system which was not accessible via MSCF at the time the key was created.

The encryption key to be entered must be specified together with the key value and key ID.

Encryption keys of foreign tapes cannot be entered in the key box using ADD-ENCRYPTION-KEY. The encryption key of a foreign tape can be entered only by calling the S procedure which was created specifically for this tape when it was exported and transferred to the exporter.

Format

ADD-ENCRYPTION-**KEY**	Alias: **ADEK**
KEY-VALUE = ***SECRET** / <c-string 32..256 with-low> / <x-string 31..256>	
,**CONFIRM-KEY-VAL**UE = ***SECRET** / <c-string 32..256 with-low> / <x-string 31..256>	
,**KEY-ID** = <structured-name 18..18>	
,**KEY-BOX** = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers>	
,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-VALUE =
Key value which is used to encrypt/decrypt the tape.

KEY-VALUE = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

CONFIRM-KEY-VALUE = *SECRET / <c-string 32..256 with-low> / <x-string 31..256>
The key value must be entered a second time to prevent incorrect entry (see the KEY-VALUE operand).

KEY-ID = <structured-name 18..18>
Key ID which was assigned to the key value in the CREATE-ENCRYPTION-KEY statement. When required, the key ID can also be determined by specifying the key value in the SHOW-ENCRYPTION-KEYS statement.

KEY-BOX =
Specifies the key box in which the encryption key is to be entered. If the key box does not yet exist on one of the specified systems, it is created there. If the key box already exists, MAREN checks whether it belongs to the domain of the local system.

KEY-BOX = *SYSTEM-KEY-BOX
The entry is made in the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the specified systems.

KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The entry is made in this key box on the specified systems.

HOST =
Specifies the systems in whose key boxes the entry is to be made.

HOST = *OWN
An entry is made only in the key box of the local system.

HOST = *ALL
The entry is made in the key boxes of all systems in the home domain which can be accessed via MSCF.

HOST = list-poss(10): <alphanum-name 1..8>
The entry is made in the key boxes of the specified systems. Only systems which belong to the home domain and can be accessed via MSCF are taken into account.

Note

MAREN generates the key ID in the CREATE-ENCRYPTION-KEY statement and makes it known to the user. In principal a key ID could also be created manually in accordance with the format constraints and entered in the key box together with a key value using the ADD-ENCRYPTION-KEY statement.
However, as the key ID must be unique in the MAREN network, encryption keys should be created exclusively with the CREATE-ENCRYPTION-KEY statement.

COPY-ENCRYPTION-KEYS
Copy encryption keys to another key box

Privilege Encryption-Key-Administrator

This statement copies encryption keys from the (input) key box to the (output) key box of the specified systems. If a key box does not exist, it is created.

Either all entries in the input key box or the entries with the key IDs specified explicitly are copied. Encryption keys for foreign tapes are not copied. The “write encryption key” attribute is not transferred when copying takes place.

This statement enables encryption keys to be copied only within a domain. Encryption keys can be transferred to another domain with a transfer key box (see EXPORT-KEY-BOX).

Format

COPY-ENCRYPTION-**KEYS**	Alias: **CPEK**
KEY-ID = ***ALL** / list-poss(10): <text 1..18 without-sep>	
,**FROM-KEY-BOX** = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers>	
,**FROM-HOST** = ***OWN** / <alphanum-name 1..8>	
,**TO-KEY-BOX** = ***SYS**TEM-**KEY-BO**X / <filename 1..54 without-gen-vers>	
,**TO-HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-ID =
Specifies which encryption keys are to be copied from the input key box.

KEY-ID = *ALL
All entries in the input key box are copied.
As the entire key box is copied, this operand also enables a backup copy of the key box to be created. However, the following actions are required to restore the original key box from the backup copy:

- Key IDs for foreign tapes must be re-entered by means of an S procedure.
- The write encryption key must be redefined.

KEY-ID = list-poss(10): <text 1..18 without-sep>
The entries with the specified key IDs are copied from the input key box. It is permissible to use the "*" wildcard as the last character in the key ID. This permits, for example, all entries which begin with a particular key ID prefix to be selected.

FROM-KEY-BOX =
Specifies the input key box whose entries are to be copied. MAREN checks whether the key box specified belongs to the domain of the local system.

FROM-KEY-BOX = *SYSTEM-KEY-BOX
The entries are copied from the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the system specified in FROM-HOST.

FROM-KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The entries are copied from the key box of the system specified in FROM-HOST

FROM-HOST =
Specifies the system in the home domain from whose key box the entries are to be copied.

FROM-HOST = *OWN
The entries are copied from the key box of the local system.

FROM-HOST = <alphanum-name 1..8>
The entries are copied from the key box of the specified system. It must be a system from the home domain, and an MSCF connection must exist to the local system.

TO-KEY-BOX =
Specifies the key box to which the encryption keys are to be copied. If the key box does not yet exist on one of the specified systems, it is created there. If the key box already exists, MAREN checks whether it belongs to the domain of the local system.

TO-KEY-BOX = *SYSTEM-KEY-BOX
The entries are copied to the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the systems specified in TO-HOST.

TO-KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The entries are copied to this key box on the systems specified in TO-HOST.

TO-HOST =
Specifies the systems to whose key box the entries are to be copied. These must be systems in the home domain, and an MSCF connection must exist to the local host.

TO-HOST = *OWN
The entries are copied only to the key boxes of the local systems.

TO-HOST = *ALL
The entries are copied to the key boxes of all hosts in the home domain which can be reached via MSCF.

TO-HOST = list-poss(10): <alphanum-name 1..8>
The entries are copied to the key boxes of the specified systems. Only systems which belong to the home domain and can be accessed via MSCF are taken into account.

CREATE-ENCRYPTION-KEY
Generate an encryption key

Privilege Encryption-Key-Administrator

This statement creates a new encryption key and enters it in the key boxes of the specified systems. If the key box does not yet exist on one of the specified systems, it is created there.

When an encryption key is created, MAREN conducts a dialog, in the course of which it displays the encryption key again and the administrator must confirm that it is stored in a safe place, see section “Dialog to create the encryption key” on page 505.
This statement is consequently only permissible in interactive mode or in foreground procedures.

The newly created encryption key can be entered only in the key boxes of the systems which belong to the home domain and can be reached via MSCF. For each of the specified systems MAREN logs whether or not this entry has been made. It may be necessary to specify the entry later on systems on which the entry could not be made (using ADD-ENCRYPTION-KEY or COPY-ENCRYPTION-KEYS statements).

The encryption key consists of the key ID and the key value. The key value is defined by the administrator, and the key ID is generated by MAREN. The key ID, which is also stored on the tape, is used to find the appropriate key value in the key box which is required to decrypt the tape.

A key ID consists of a total of 18 characters and has the following format:
`<prefix>-<date>-<time>`, e.g. EKID-080912-115731.

Meaning:

`<prefix>`	Prefix four characters in length, see the PREFIX-OF-KEY-ID operand
`<date>`	Creation date in the format `yymmdd` (set by MAREN)
`<time>`	Creation time in the format `hhmmss` (set by MAREN)

CAUTION! An additional copy of the encryption key must always be stored:

- The encryption key administrator **must** make a note of the encryption key, which consists of the key ID **and** key value, and store this in a safe place (e.g. a safe).
- The encryption key must be stored for as long as tapes which are encrypted with it are used.

It is essential to store an additional copy of the encryption key in case the key box is destroyed and it can also not be reconstructed from a backup. Without the encryption key, the tape contents which it was used to encrypt can no longer be decrypted.

If an encryption key is also to be used as a write encryption key, this must be defined explicitly with SET-WRITE-ENCRYPTION-KEY statement.

Format

CREATE-**ENC**RYPTION-**KEY**	Alias: **CREK**
KEY-VALUE = ***SECRET** / <c-string 32..256 with-low> / <x-string 31..256>	
,**CONFIRM-KEY-VAL**UE = ***SECRET** / <c-string 32..256 with-low> / <x-string 31..256>	
,**PREFIX-OF-KEY-ID** = <name 4..4>	
,**KEY-BOX** = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers>	
,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-VALUE = <c-string 32..256 with-low> / <x-string 31..256>
Key value which is used to encrypt/decrypt the tape. To guarantee a high level of security during encryption, the key value should be at least 32 characters long.

KEY-VALUE = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

CONFIRM-KEY-VALUE = *SECRET / <c-string 32..256 with-low> / <x-string 31..256>
The key value must be entered a second time to prevent incorrect entry (see the KEY-VALUE operand).

PREFIX-OF-KEY-ID = <name 4..4>
Specifies the prefix of the key ID. The user specifies these first 4 characters of the key ID to identify the encryption keys he/she assigns. This enables the user to select his/her encryption keys in the SHOW statements, for example.
The remaining characters of the key ID are generated by MAREN.

KEY-BOX =
Specifies the key box in which the encryption key is to be entered. If the key box does not yet exist on one of the specified systems, it is created there. If the key box already exists, MAREN checks whether it belongs to the domain of the local system.

KEY-BOX = *SYSTEM-KEY-BOX
The entry is made in the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the specified systems.

KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The entry is made in this key box on the specified systems.

HOST =
Specifies the systems in whose key boxes the encryption key is to be entered.

HOST = *OWN
The encryption key is entered in the key box of the local system.

HOST = *ALL
The encryption key is entered in the key box of all systems in the local domain which can be accessed via MSCF.

HOST = list-poss(10): <alphanum-name 1..8>
The encryption key is entered in the key boxes of the specified systems.
Only systems which belong to the home domain and can be accessed via MSCF are taken into account.

Dialog to create the encryption key

The greatest care must be taken when defining encryption keys. The administrator may not make any errors when typing in the key value and must store the key value and the key ID in a safe place (e.g. a safe). MAREN consequently conducts a dialog while the statement is being executed:

- After the statement has been entered, the administrator is notified that confidential data will be output on the screen (and printer) while the statement executes. The administrator must confirm that execution should continue or abort the function.
- MAREN logs the specified key value and the returned key ID on the screen and points out that the encryption data must be stored in a safe place. The administrator can now check the data again and, if there is an error, abort the function.
- When the administrator has noted down the encryption data and stored it safely, he/she acknowledges the message. Only now is the encryption data saved in the key box.

  The administrator must ensure that the encryption data displayed on the screen and which he/she has noted down or printed out is not accessible to unauthorized persons.
- Finally, MAREN notifies the administrator that the newly generated encryption key can only be used for encryption purposes when it has been activated as a write encryption key by means of SET-WRITE-ENCRYPTION-KEY.

DELETE-KEY-BOX
Delete a key box

Privilege Encryption-Key-Administrator

This statements deletes a key box on the specified systems. The entry in the file catalog is deleted and the released memory space is overwritten with binary zeros (cf. the OPTION=*DESTROY-ALL operand of the DELETE-FILE command).

A system key box can be deleted only if the MAREN catalog contains no tapes which are encrypted with one of the key box entries. MAREN always rejects the delete request if the MAREN catalog cannot be accessed to check the key IDs. If such tapes still exist and are no longer required, they must be released in the MAREN catalog before the key box is deleted. The SHOW-ENCRYPTION-KEYS statement initially enables the encryption keys to be determined for which encrypted tapes still exist in the MAREN catalog. The tapes which were encrypted with a particular encryption key can then be displayed using the SHOW-VOLUME-ENCRYPTION-ATTR statement.

This statement can also be used to delete private key boxes and transfer key boxes (see EXPORT-KEY-BOX). However, no check is made with the MAREN catalog in this case.

Format

DELETE-**KEY-BOX**	Alias: **DLKB**
KEY-BOX = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers> ,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-BOX =
Specifies which key box is to be deleted. MAREN checks whether the key box specified belongs to the domain of the local system.

KEY-BOX = *SYSTEM-KEY-BOX
The key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the specified systems is deleted. Deletion is possible only if the MAREN catalog contains no tapes which were encrypted using the entries in this key box.

KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. This key box is deleted on the specified systems.

HOST =
Specifies the systems on which the key box is to be deleted.

HOST = *OWN
The key box of the local system is deleted.

HOST = *ALL
The key box is deleted on all systems of the home domain which can be accessed via MSCF.

HOST = list-poss(10): <alphanum-name 1..8>
The key box is deleted on the specified systems. It is deleted only on systems which belong to the home domain and can be accessed via MSCF.

Note

A distinction must be made between the following cases if the key box's memory space cannot be overwritten:

- In interactive mode MARENEKM issues a warning and, depending on the user's reply, the delete request is rejected or the key box is only deleted logically.
- In batch mode the delete request is rejected.

EXPORT-KEY-BOX
Generate a transfer key box

Privilege Encryption-Key-Administrator

This statement creates a transfer key box which is specially prepared for use in another MAREN domain. All entries in the input key box are copied to the transfer key box with the exception of the encryption keys for foreign tapes. The “write encryption key” attribute is not transferred when copying takes place. If the file name specified for the transfer key box already exists, the job is rejected.

Before the transfer key box is created, the encryption key administrators of the two domains must agree on the following details:

- Name of the system on which the key box will be imported (i.e. on which the IMPORT-KEY-BOX statement will be entered)
- Password which must be specified for the import
- Location for the transfer key box generated

As the name of the import system and the import password are stored in the transfer key box, the transfer key box can be imported only on this system and by specifying the password.

The transfer key box is a special form of key box. It is only permitted in the EXPORT- (as output file) and IMPORT-KEY-BOX (as input file) statements, and in DELETE- and REPAIR-KEY-BOX. It cannot be accessed in any other statement.

Format

EXPORT-**KEY-BOX**	Alias: **EXKB**
FROM-KEY-BOX = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers>	
,**FROM-HOST** = ***OWN** / <alphanum-name 1..8>	
,**TRANSFER-KEY-BO**X = <filename 1..54 without-gen-vers>	
,**DEPOT-HOST** = ***OWN** / ***IMP**ORT-**PROC**ESS-**HOST**	
,**IMP**ORT-**PROC**ESS-**HOST** = <alphanum-name 1..8>	
,**IMP**ORT-**PASS**WORD = ***SECRET** / <c-string 8..16> / <x-string 15..32>	
,**CONFIRM-PASS**WORD = ***SECRET** / <c-string 8..16> / <x-string 15..32>	

Operands

FROM-KEY-BOX =
Specifies the input key box whose entries are to be exported. MAREN checks whether the key box specified belongs to the domain of the local system.

FROM-KEY-BOX = *SYSTEM-KEY-BOX
The key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the system specified in FROM-HOST is exported.

FROM-KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. This may not already be a transfer key box. The key box is exported from the system specified in FROM-HOST.

FROM-HOST =
Specifies the system of the home domain whose key box is to be exported.

FROM-HOST = *OWN
The key box of the local system is exported.

FROM-HOST = <alphanum-name 1..8>
The key box of the system specified is exported. It must be a system from the home domain, and an MSCF connection must exist to the local system.

TRANSFER-KEY-BOX = <filename 1..54 without-gen-vers>
File name of the transfer key box. The name of the system key box may not be specified. If the file already exists, the statement is aborted.

DEPOT-HOST =
System on which the transfer key box is stored. It can be stored either on the local system or on the system of the other domain on which it is to be imported.

DEPOT-HOST = *OWN
The transfer key box is stored on the local system.

DEPOT-HOST = *IMPORT-PROCESS-HOST
The transfer key box is stored on the system on which it is to be imported. It must be possible to reach the system via MSCF.

IMPORT-PROCESS-HOST = <alphanum-name 1..8>
Name of the system on which the transfer key box is to be imported. The import may only take place on this system.

IMPORT-PASSWORD = *SECRET / <c-string 8..16> / <x-string 15..32>
Password which the encryption key administrator of the other domain must specify when importing.

IMPORT-PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

CONFIRM-PASSWORD = *SECRET / <c-string 8..16> / <x-string 15..32>
The import password must be entered a second time to prevent incorrect entry (see the IMPORT-PASSWORD operand).

Notes

A key box is always assigned to the domain in the MAREN catalog for which it was created. This assignment is implemented using a uniform domain-specific flag in the catalog and in the key box. This assignment is checked each time the key box is accessed.

If domains are reassigned when the MAREN network is reorganized, the domain assignment of the key box must also be adjusted. A different domain is assigned if the a key box is created on the system of the other domain by means of an import from the transfer key box created beforehand (export).

The following steps are required to move a key box to another domain:

1. The tape key administrator of the original domain uses COPY-ENCRYPTION-KEY to create a key box containing all the encryption keys which are to be transferred to the target domain.

```
//COPY-ENCRYPTION-KEY KEY-ID=<list_of_key-ids>,
                      TO-KEY-BOX=key-box.for-user-b
```

2. The tape key administrators of the original and target domains define the import system of the target domain and the import password.

3. The encryption key administrator of the original domain creates the transfer key box with EXPORT-KEY-BOX:

```
//EXPORT-KEY-BOX FROM-KEY-BOX=key-box.for-user-b, FROM-HOST=*OWN,
                 TRANSFER-KEY-BOX=transfer.key-box,
                 DEPOT-HOST=*IMPORT-PROCESS-HOST,
                 IMPORT-PASSWORD=*SECRET,CONFIRM-PASSWORD=*SECRET,
                 IMPORT-PROCESS-HOST=system2
```

4. The encryption key administrator of the target domain imports the transfer key box to his/her own domain on the specified system:

```
//IMPORT-KEY-BOX TRANSFER-KEY-BOX=transfer.key-box,DEPOT-HOST=*OWN,
                 TO-KEY-BOX=*SYSTEM-KEY-BOX,TO-HOST=*OWN,
                 PASSWORD=*SECRET
```

   If the transfer data (name of the import system and the import password) matches, an existing key box (in this case the system key box) is extended by the entries in the transfer key box or a new key box with the identifier of the target domain is created. If the transfer data does not match, the import statement is aborted.

   After its entries have been successfully imported, the transfer key box is implicitly deleted.

IMPORT-KEY-BOX
Import a transfer key box

Privilege Encryption-Key-Administrator

This statement imports a transfer key box into a MAREN domain The transfer key box must have been generated in the owner domain using EXPORT-KEY-BOX. The transfer key box may only be imported, i.e. the IMPORT-KEY-BOX statement is only permissible on the system which was defined as the IMPORT-PROCESS-HOST in EXPORT-KEY-BOX. The same password must also be specified in IMPORT-KEY-BOX.

Depending on which location was specified when the export took place, the transfer key box is located either on the system which executed EXPORT-KEY-BOX or on the system which may execute IMPORT-KEY-BOX.

After its entries have been successfully imported, the transfer key box is implicitly deleted.

Format

IMPORT-**KEY-BOX**	Alias: **IMKB**
TRANSFER-KEY-BOX = <filename 1..54 without-gen-vers>	
,**DEPOT-HOST** = ***OWN** / <alphanum-name 1..8>	
,**TO-KEY-BOX** = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers>	
,**TO-HOST** = ***OWN** / <alphanum-name 1..8>	
,**PASS**WORD = ***SECRET** / <c-string 8..16> / <x-string 15..32>	

Operands

TRANSFER-KEY-BOX = <filename 1..54 without-gen-vers>
File name of the transfer key box. If the key box specified is not a transfer key box, the statement is rejected.

DEPOT-HOST =
System on which the transfer key box was stored during the export procedure. It is stored either on the system which executed EXPORT-KEY-BOX or on the system which may execute IMPORT-KEY-BOX.

DEPOT-HOST = *OWN
During the export procedure, the transfer key box had already been stored on the system which may execute IMPORT-KEY-BOX, i.e. MARENEKM expects it on the local system.

DEPOT-HOST = <alphanum-name 1..8>
Name of the system. If the transfer key box is not located on the local system, it can only be located on the system on which it was created. No other systems can be specified. If the local system is not specified, the system which is specified must have an active MSCF connection to the local system.

TO-KEY-BOX =
Specifies the target key box. If the key box does not yet exist, it is created. An existing key box must belong to the domain of the local system. Only in this case is it extended by all the entries in the transfer key box.

TO-KEY-BOX = *SYSTEM-KEY-BOX
The key box `$SYSMAREN.MAREN.KEY-BOX` is created or extended on the home pubset of the system specified in TO-HOST.

TO-KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The specified key box is created or extended on the specified system.

TO-HOST =
Specifies the system on which the target key box is created or extended.

TO-HOST = *OWN
The target key box is created or extended on the local system.

TO-HOST = <alphanum-name 1..8>
The target key box is created or extended on the specified system in the home domain. It must be possible to reach the system via MSCF.

PASSWORD = *SECRET / <c-string 8..16> / <x-string 15..32>
Password which was defined during the export procedure.

PASSWORD = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

MODIFY-VOLUME-ENCRYPTION-ATTR
Update encryption attributes

Privilege Encryption-Key-Administrator

This statement updates the encryption data of an encrypted tape (volume type TAPE-UxE) in the MAREN catalog.

The catalog record of an encrypted tape contains the key ID of the encryption key which was used to encrypt the tape. MAREN can use the key ID to check whether any tape encrypted with a particular encryption key still exists and can then, if required, reject a request to remove the encryption key (with REMOVE-ENCRYPTION-KEYS) or to delete the key box (with DELETE-KEY-BOX). This information is also used to determine the associated tapes for a specific key ID using SHOW-VOLUME-ENCRYPTION-ATTR. In the case of SHOW-ENCRYPTION-KEYS the encryption keys for which there are still encrypted tapes are flagged.

If the key IDs in the MAREN catalog have been destroyed, the encryption key administrator can use the MODIFY-VOLUME-ENCRYPTION-ATTR statement to restore them. If a key ID is not known (e.g. from an old SHOW-VOLUME-ENCRYPTION-ATTR list), it cannot be deduced reliably (from the creation dates for write encryption keys which are also output when the SHOW-ENCRYPTION-KEYS is executed). This repair method should therefore only be used in exceptional circumstances.

Instead, encryption data should be repaired by means of a read access to the tape since MAREN updates the key ID in the catalog with the tape's original data each time an encrypted tape is accessed. This permits reliable repair without the key ID being known.

Format

MODIFY-**VOL**UME-**ENC**RYPTION-**ATTR**	Alias: **MDVEA**
VOLUME = <vsn 1..6> ,**KEY-ID** = ***UNCH**ANGED / <structured-name 18..18>	

Operands

VOLUME = <vsn 1..6>
Tape archive number FSEQ=1 is assumed implicitly.

KEY-ID = *UNCHANGED / <structured-name 18..18>
Key ID which is to be entered in the MAREN catalog for the specified tape. When the default *UNCHANGED is specified, the existing value is retained.

REMOVE-ENCRYPTION-KEYS
Remove encryption keys from the key box

Privilege Encryption-Key-Administrator

This statement deletes encryption keys from the key boxes of the specified systems. An encryption key which is used as a write encryption key cannot be removed, however. It can only be removed when a specification is changed using SET-WRITE-ENCRYPTION-KEY.

An encryption key can be removed from the system key box only when the MAREN catalog contains no tapes which were encrypted with this encryption key. MAREN always rejects the delete request if the MAREN catalog cannot be accessed to check the Key ID. If such tapes still exist and are no longer required, they must be released in the MAREN catalog before the encryption key is released. The tapes which were encrypted using a particular encryption key can be displayed using the SHOW-VOLUME-ENCRYPTION-ATTR statement.

Format

REMOVE-**ENC**RYPTION-**KEYS**	Alias: **RMEK**
KEY-ID = <text 1..18 without-sep>	
,**KEY-BOX** = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers>	
,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-ID = <text 1..18 without-sep>
Key ID of the encryption key to be removed. It is permissible to use the wildcard “*” (asterisk) as the last character in the string. In this way all key IDs which begin with the specified string are flagged.
The key ID was assigned to a key value when the encryption key was created. The key ID for a key value can also be determined using the SHOW-ENCRYPTION-KEYS statement (however, multiple key IDs can exist for one key value).

KEY-BOX =
Determines the key box from which the encryption key is to be removed. MAREN checks whether the key box specified belongs to the domain of the local system.

KEY-BOX = *SYSTEM-KEY-BOX
The entry is removed from the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the specified system. Deletion is possible only if the MAREN catalog contains no tapes which were encrypted using this encryption key.

KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The entry is removed from this key box on each of the systems specified.

HOST =
Specifies the systems from whose key boxes the entry is to be removed.

HOST = *OWN
The entry is removed only from the key box of the local system.

HOST = *ALL
The entry is deleted in the key boxes of all systems in the home domain which can be reached via MSCF.

HOST = list-poss(10): <alphanum-name 1..8>
The entry is removed from the key boxes of the specified systems. Only systems which belong to the home domain and can be accessed via MSCF are taken into account.

REPAIR-KEY-BOX
Repair a key box

Privilege Encryption-Key-Administrator

This statement reconstructs a key box which was not closed properly on account of a system crash or an aborted job. The catalog entry is updated, any lock which exists is implicitly lifted, and the file is closed.

The statement can also be used to repair transfer key boxes.

Format

REPAIR-KEY-BOX	Alias: **RPKB**
KEY-BOX = ***SYS**TEM-**KEY-BOX** / <filename 1..54 without-gen-vers> ,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-BOX =
Specifies the key box which is to be repaired. MAREN checks whether the key box specified belongs to the domain of the local system.

KEY-BOX = *SYSTEM-KEY-BOX
The key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubsets of the specified systems is reconstructed.

KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. This key box is reconstructed on the specified systems.

HOST =
Specifies the systems whose key box is to be reconstructed.

HOST = *OWN
Only the key box of the local system is reconstructed.

HOST = *ALL
The key boxes of all systems in the home domain which can be accessed via MSCF are reconstructed.

HOST = list-poss(10): <alphanum-name 1..8>
The key boxes of the systems specified in the home domain which can be accessed via MSCF are reconstructed.

SET-WRITE-ENCRYPTION-KEY
Define the encryption key for encryption

Privilege Encryption-Key-Administrator

This statement defines which encryption key is to be used for tape encryption. This “write encryption key” is used with immediate effect on the specified systems for encrypting the tape contents when writing. The specified encryption key must already exist, i.e. it must already have been entered (using CREATE-ENCRYPTION-KEY or ADD-ENCRYPTION-KEY) in the key boxes of the systems which are to use it as a write encryption key.

Only one write encryption key can ever exist in a key box. When the encryption key is defined as the valid write encryption key, it is flagged as such. A previously defined write encryption key is then once more flagged as a normal entry. If no write encryption key is defined in a key box, tapes can only be decrypted on this system, not encrypted. A write encryption key can only be defined explicitly using this statement. The “write encryption key” attribute is not transferred when encryption keys are copied, exported or imported.

Specifying KEY-ID=*NONE removes the write encryption key completely from the key box without replacing it. Only when a new write encryption key is defined for the systems concerned can tapes be encrypted on them again. Until this is the case, the key box can only be used for decryption.

Notes

The encryption key which is currently flagged as the “write encryption key” cannot be removed from the key box using REMOVE-ENCRYPTION-KEYS. This prevents the write encryption key from being deleted inadvertently.

When an encrypted tape is to be updated, PTAM supplies the encryption data from the start of the tape to MARENEKM, and MARENEKM searches for the associated encryption key in the key box. This must be contained in the key box, but it need not still be the current write encryption key.

Format

SET-WRITE-**ENC**RYPTION-**KEY**	Alias: **STWEK**
KEY-ID = ***NONE** / <structured-name 18..18> ,**KEY-BO**X = ***SYS**TEM-**KEY-BOX** ,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>	

Operands

KEY-ID =
Specifies which encryption key is to be used as the write encryption key.

KEY-ID = *NONE
No encryption key is to be used as the write encryption key. The key box can only be used for decrypting until a new write encryption key has been defined.

KEY-ID = <structured-name 18..18>
Key ID of the encryption key which is to be used as the write encryption key.
The key ID was assigned to a key value when the encryption key was created. The key ID for a key value can also be determined using the SHOW-ENCRYPTION-KEYS statement (however, multiple key IDs can exist for one key value).

KEY-BOX = *SYSTEM-KEY-BOX
The specification is made in the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubset of the specified systems. MAREN checks whether the key box specified belongs to the domain of the local system.

HOST =
Determines the systems in whose key boxes the specification is to be entered.

HOST = *OWN
The specification is entered only in the key box of the local system.

HOST = *ALL
The specification is entered in the key boxes of all systems in the home domain which can be accessed via MSCF.

HOST = list-poss(10): <alphanum-name 1..8>
The specification is entered in the key boxes of the specified systems. Only systems which belong to the home domain and can be accessed via MSCF are taken into account.

SHOW-ENCRYPTION-KEYS
Display the encryption keys of a key box

Privilege Encryption-Key-Administrator

This statement displays the encryption keys from the key boxes of the specified systems.

The following entries are available for information output:

- the entry with the write encryption key currently defined (default)
- all entries of the key box
- particular entries, specified either by means of the key value or the key ID

Each entry which is selected is output to SYSOUT together with its key ID and the associated metadata. The key values are not output. Special flags are provided for the entry for the write encryption key and entries for foreign tapes. Special flags are also provided for entries for which tapes exist in the MAREN catalog which were encrypted using the associated encryption keys. The tapes which were encrypted using a particular encryption key can be displayed using the SHOW-VOLUME-ENCRYPTION-ATTR statement.

Format

SHOW-ENCRYPTION**-KEYS** Alias: **SHEK**

ENCRYPTION**-KEY** = ***WR**ITE**-ENC**RYPTION**-KEY** / ***ALL** / ***BY-KEY-VAL**UE(...) / ***BY-KEY-ID**(...)

***BY-KEY-VAL**UE(...)
KEY-VALUE = ***SECRET** / <c-string 32..256 with-low> / <x-string 31..256>

***BY-KEY-ID**(...)
KEY-ID = <text 1..18 without-sep>

,**KEY-BOX** = ***SYS**TEM**-KEY-BOX** / <filename 1..54 without-gen-vers>

,**HOST** = ***OWN** / ***ALL** / list-poss(10): <alphanum-name 1..8>

Operands

ENCRYPTION-KEY =
Specifies the encryption keys for which the entries in the key box are to be displayed.

ENCRYPTION-KEY = *WRITE-ENCRYPTION-KEY
Only the entry for the current write encryption key is displayed. If the key box does not contain a write encryption key, this is reported.

ENCRYPTION-KEY = *ALL
All entries in the key box are displayed.

ENCRYPTION-KEY = *BY-KEY-VALUE(...)
Only the entries for the encryption keys with the specified key value are displayed (multiple key IDs can exist for one key value).

KEY-VALUE = *SECRET / <c-string 32..256 with-low> / <x-string 31..256>
Key value which is used for encrypting/decrypting tapes.

KEY-VALUE = *SECRET
Requests a blanked-out input field for the password. Entries in this field are not visible on the screen.
This operand value can only be specified in unguided dialog. In guided dialog, the field provided for entering passwords is always blanked out.

ENCRYPTION-KEY = *BY-KEY-ID(...)
Only the entries for the encryption keys with the specified key ID are displayed.

KEY-ID = <text 1..18 without-sep>
Key ID which was assigned to the encryption key when it was created. It is permissible to use the wildcard “*” (asterisk) as the last character in the string. In this way all key IDs which begin with the specified string are flagged.

KEY-BOX =
Specifies the key box from which the information is to be displayed. MAREN checks whether the key box specified belongs to the domain of the local system.

KEY-BOX = *SYSTEM-KEY-BOX
The information from the key box `$SYSMAREN.MAREN.KEY-BOX` on the home pubsets of the specified systems is displayed.

KEY-BOX = <filename 1..54 without-gen-vers>
Name of the key box. The information from this key box on the specified systems is displayed.

HOST =
Specifies the systems from whose key boxes the information is to be displayed.

HOST = *OWN
Only the information from the key box of the local system is displayed.

HOST = *ALL
The information from the key boxes of all systems in the home domain which can be accessed via MSCF is displayed.

HOST = list-poss(10): <alphanum-name 1..8>
The information from the key boxes of the specified systems is displayed. Only systems which belong to the home domain and can be accessed via MSCF are taken into account.

Output information

The following information is displayed for each selected entry in the key box:

- Key ID
- Creation date of the entry
- Date when last used for encryption
- Date when last used for decryption
- Displays whether the entry is currently used as the write encryption key (SPECIAL USAGE: WRITE)
- Displays whether the entry was created for a foreign tape (SPECIAL USAGE: PRIV)
- Displays whether tapes which were encrypted with the encryption key are entered in the catalog (USED-BY-MAREN: YES)

Detailed information on tapes which were encrypted with a specific encryption key can be requested using the SHOW-VOLUME-ENCRYTION-ATTR statement.

SHOW-VOLUME-ENCRYPTION-ATTR
Display encryption attributes of encrypted tapes

Privilege Encryption-Key-Administrator

This statement outputs encryption data for reserved encrypted tapes (volume type TAPE-UxE) from the MAREN catalog to SYSOUT. The default value outputs the data of all encrypted tapes. Information on an individual archive number or a range of archive numbers can also be requested. The set of tapes can also be restricted to a particular user ID and/or to tapes which were encrypted using a particular encryption key.

Format

SHOW-VOLUME**-ENC**RYPTION**-ATTR** Alias: **SHVEA**

VOLUME = ***ALL** / ***INT**ERVAL(...) / <vsn 1..6>

***INT**ERVAL(...)
FROM-VSN = <vsn 1..6>
,**TO-VSN** = <vsn 1..6>

,**USER-ID**ENTIFICATION = ***ALL** / <name 1..8>

,**KEY-ID** = ***ALL** / <text 1..18 without-sep>

Operands

VOLUME =
Archive numbers. Only encrypted volumes, i.e. tapes of the tape type TAPE-UxE, are taken into account.

VOLUME = *ALL
Information is displayed for all encrypted tapes.

VOLUME = *INTERVAL(...)
Information is displayed for the encrypted tapes whose archive numbers are contained in the range specified below. FROM-VSN must be ≤ TO-VSN here.

FROM-VSN = <vsn 1..6>
Lowest archive number in the range of the tapes to be displayed.

TO-VSN = <vsn 1..6>
Highest archive number in the range of the tapes to be displayed.

VOLUME = <vsn 1..6>
Archive number of the tapes to be displayed.

USER-IDENTIFICATION =
Specifies whether the display is to be restricted to tapes of a particular user ID.

USER-IDENTIFICATION = *ALL
Tapes of all user IDs are displayed.

USER-IDENTIFICATION = <name 1..8>
Only tapes of the specified user ID are displayed.

KEY-ID =
Specifies whether the display is to be restricted to tapes which were encrypted using a particular encryption key.

KEY-ID = *ALL
Tapes are displayed irrespective of the encryption key.

KEY-ID = <text 1..18 without-sep>
Key ID of the encryption key. It is permissible to use the wildcard “*” (asterisk) as the last character in the string. In this way all key IDs which begin with the specified string are flagged. Only tapes which were encrypted using an encryption key are displayed.

Output information

The following information is displayed for each tape:

- VSN
- Key ID
- User ID for which the tape is reserved
- Release date (FREE-DATE)
- Expiration date (EXPIRATION-DATE)
- Displays whether the entry was created for a foreign tape (STATUS: PRIV)

13 Error handling

During the MAREN session, various kinds of errors may occur. The actions which the administrator and, if applicable, the ADA perform that are required for handling the most common error situations are described below.

13.1 Catalog inconsistency

If a loss of the MAREN catalog occurs, the last backup status of the MAREN catalog must be used. The MARENADM statement UPDATE-MAREN-CATALOG can then be used to enter all the changes to the inventory which have subsequently occurred in the backup status of the MAREN catalog by means of the logging files. The current status of the MAREN catalog can be reconstructed in this way.

The MAREN catalog and the logging files should be situated on different pubsets.

13.2 System failure in exclusive mode

This situation only interferes with MAREN operation on other systems if the failed system is currently maintaining a lock on the shared pubset.

With the following operator command, this lock can be forcibly canceled:
`/UNLOCK-DISK *PUBSET-DEVICES=<cat-id>,...`

13.3 System failure in shared mode

For error situations in shared mode, the consequences of a system breakdown depend on which system has crashed:

- Remote system failure

  The crash of a system with remote access to the MAREN catalog via RFA is not critical for MAREN operation on the other systems, since no locks are maintained on the MAREN catalog.

- Failure of the system with the MAREN catalog

  The crash of a system with direct access to the MAREN catalog requires organizational measures to continue MAREN operation on the remaining systems:

  – Shutting down MAREN on all systems Currently active jobs attempting to access the MAREN catalog are all in the MAREN queue, with the exception of one. Handling of these jobs is described below.

  – The MAREN catalog must be imported to a system which is still intact. Care must be taken at hardware generation time to ensure that the disk device has connections to more than one system.

  – Restart MAREN on all systems using the updated catalog ID in the ENTER files, if necessary.

13.4 Network failure in shared mode

When faults which last for some time occur on the network connections between various systems, it may be necessary to operate MAREN locally on each system. This situation is made evident by a console message generated via the specified batch jobs after the defined wait time has expired. For simultaneous operation of more than one local MAREN system, the following steps must be taken:

- A copy of the MAREN catalog must to transported to each system.
- Separate pools of free tapes must be created on all systems, in order to continue to make use of automatic free tape allocation. This can also be accomplished by means of appropriate exit routines, which must, of course, have been set up in advance as a precautionary measure.
- By means of organizational measures, e.g. information via the MAREN bulletin, it must be ensured that each tape is being requested and processed by one and only one system.
- After local MAREN operations are terminated, the MARENADM statement UPDATE-MAREN-CATALOG can be used to create a fully up-to-date MAREN catalog from all logging files.

13.5 Short-term system or network failure

If it is obvious that the failure will only last for a brief period, the actions described above should, if avoidable, not be taken since they are quite extensive; instead, wait for the end of the interruption. All tasks involving tape processing are then put in defined queues; these are described in section “Expiration of the wait time” on page 529.

13.6 Offline logging

If, for whatever reason, the MAREN catalog is not available, so-called offline logging may be activated. This means that processing does continue without the MAREN catalog, but logging records are still written. A prerequisite for this is that the control task MARENCP continues to run. Once the error has been recovered, a current MAREN catalog can be generated using the UPDATE-MAREN-CATALOG statement. However, this emergency mode has the drawback that data security is no longer guaranteed since MAREN can perform no further checks.
Furthermore, devices assigned to a storage location by means of the ADD-DEVICE-DEPOT command can no longer be used.

Offline logging is activated by starting a MARENCP ENTER file without the link name MARENCAT (see section “Execution of MARENCP” on page 46). The MARENADM administrator program can only be used in interactive mode with severe restrictions (only the STOP-CONTROL-PROGRAM statement) and in batch mode, the program cannot be used at all.

13.7 Expiration of the wait time

In all of the previously mentioned error situations, all specified jobs remain in the MAREN queue, waiting for recovery of the error. A lifetime monitor is provided to avoid endless wait times, in particular in interactive mode with following consequences:

- Interactive tasks receive an appropriate message after the set interactive wait time, for example 3 minutes, has expired:
  - In procedure mode, the request is rejected.
  - In interactive mode the user receives a query message to which he/she can respond.
- In the case of batch tasks, console message `MAR0085` appears after the set wait time, has expired; there are three possible ways of responding to this message:

  `tsn.0` EXIT (error exit)
  The current program branches via the EXLST output or the current job branches to the next STEP command.

  `tsn.1` RETRY (repeated attempt)

  `tsn.2` CONTINUE (continue processing without MAREN)

  If the error affects a MAREN processing situation which does not permit abortion, console message `MAR0086` appears, which only permits the two responses `tsn.1` (RETRY) and `tsn.2` (CONTINUE).
  The only way to ensure that processing is not continued is to abort the batch job using the command CANCEL-JOB.
  When the cause of the problem has been corrected, the query is withdrawn within 1 minute, the request is repeated and the batch process continues to operate normally.

13.8 Crash of a user job

If a user task is terminated with an error while an output tape is being created, i.e. not via the normal CLOSE macro, this condition is made evident by the fact that the catalog entry field CLOSE-INDICATOR is not set to “CLOSED”. Here it is up to the user to decide what to do with the tapes affected.

13.9 Critical messages

The output of MAREN messages that are output on the console in error situations should be monitored by the operator so that important error situations can be quickly identified and prevented and, if appropriate, specific recovery measures can be started.

Only the messages for the most important error situations are listed in the following.

Messages of the MARENCP task:

```
MARCP06 ... MARCP10              MARCP22
MARCP13                          MARCP27
MARCP15                          MARCP33 ... MARCP39
MARCP17 bis MARCP18              MARFA18
```

Messages of the MARENUCP task:

```
MARUP81 ... MARUP84              MARUP89
MARUP86                          MARUP97 ... MARUP99
```

Messages of the MAREN subsystem:

```
MAR0051                          MAR4102
MAR0061                          MAR4181
MAR0082 ... MAR0087
```

14 Appendix

14.1 Statement operands and volume catalog entry fields

The following table gives an overview of the volume catalog entry fields to which the operands of the individual statement refer, as well as the terms used when a volume catalog entry field is output.

Volume catalog entry field	Field name in the DSECT of the macro MARENA	Field name in the output of SHOW-VOLUME-ATTRIBUTES	S variable name in the output of SHOW-VOLUME-ATTRIBUTES
ACCESS-COUNT	ACCOUNT8	ACCESS-COUNT	ACCESS-COUNT
ACCOUNT	OWNERACC	ACCOUNT	USER-ACCOUNT
ADMINISTRATOR-FIELD	RZFELD	ADM-FIELD	ADM-FIELD
ADMINISTRATOR-FIELD 2	RZFELD2	ADM-FIELD /2	ADM-FIELD-2
ARCHIVE-USAGE	FSTATUS	FREE-POOL	FREE-POOL
CHECK-COUNT	PRUEFZ	CHECK-COUNT	CHECK-COUNT
CLOSE-INDICATOR	CLOSEIND	CLOSE-IND	CLOSE-INDICATOR
CREATION-CAT-ID	CRCATID	CR-CAT-ID	CRE-CAT-ID
CREATION-DATE	XCRDATE	CR-DATE	CRE-DATE
CREATION-JOB-NAME (other cases), REQUEST-NAME (HSMS)	CRJOB	CR-JOB (other cases) REQUEST-NAME (HSMS)	CRE-JOB-NAME
CREATION-TIME	CRTIME	CR-TIME	CRE-TIME
CREATION-USER-ID	CRUSERID	CR-USER-ID	CRE-USER-ID
DEC# OF SAVED PAM-PAGES	PAMPAG#	LAST-WRITE-BLK-CNT	LAST-WRT-BLOCK-CNT
DEVICE-NAME	MNEMONI4	DEV-NAME	DEV-NAME
DEVICE-TYPE	DEVICE	DEV-TYPE	DEV-TYPE
DIRECTORY-NAME	DIRNAME	DIRECTORY-NAME	DIR-NAME
DIRECTORY-ON-VOLUME	DIRONVOL	DIR-ON-VOL	DIR-ON-VOL

(part 1 of 3)

Volume catalog entry field	Field name in the DSECT of the macro MARENA	Field name in the output of SHOW-VOLUME-ATTRIBUTES	S variable name in the output of SHOW-VOLUME-ATTRIBUTES
DOMAIN-NAME	XYDOMAIN	DOMAIN	DOMAIN
EXPIRATION-DATE	XEXDATE	EXPIR-DATE	EXPIR-DATE
Only for S variable	Only for S variable	Only for S variable	EXPORTED
EXPORT-ADDRESS	LEIHADR	EXPORT	EXPORT-ADDR
EXPORT-DATE	XLEIHDAT	EXPORT-DATE	EXPORT-DATE
FILENAME	FILENM41	FILE-NAME	F-NAME
FILE-SEQUENCE#	FSEQ	FILE-SEQ	F-SEQ
FIRST-VOLUME	ERSTVSN	FIRST-VOL	FIRST-VOL
FREE-DATE	XFREIDATE	FREE-DATE	FREE-DATE
FREE-LOCATION	FREELOC	FREE-LOCATION	FREE-LOCATION
FREE-POOL	FREEPOOL	FREE-POOL	FREE-POOL
FROM (INTERVAL)	NUMMANFV	Only internal	Only internal
FROM-FSEQ (INTERVAL)	NUMMANFF	Only internal	Only internal
HOME-LOCATION	HOMELOC	HOME-LOCATION	HOME-LOCATION
INDICATOR 1 (AUDIT)	ARCHIND1	AUDIT	AUDIT
INITIALIZATION	INITFLAG	INIT	INIT
LAST-ACCESS-ACCOUNT	LAACC	LAST-ACC-ACCOUNT	LAST-ACCESS-ACCOUNT
LAST-ACCESS-HOSTNAME	LACPU	LAST-ACC-HOSTNAME	LAST-ACCESS-HOSTNAM
LAST-ACCESS-DATE	XLADATE	LAST-ACC-DATE	LAST-ACCESS-DATE
LAST-ACCESS-FUNCTION-FLAG	LAFUNKFL	LAST-ACC-FUN-FLAG	LAST-ACC-FUNC-FLAG
LAST-ACCESS-FUNKTION-NAME	LAFUNKNM	LAST-ACC-FUN-NAME	LAST-ACC-FUNC-NAME
LAST-ACCESS-JOB-NAME	LAJOB	LAST-ACC-JOB-NAME	LAST-ACCESS-JOB-NAM
LAST-ACCESS-SNO	LASNO	LAST-ACC-SNO	LAST-ACC-SESSION-NR
LAST-ACCESS-TIME	LATIME	LAST-ACC-TIME	LAST-ACCESS-TIME
LAST-ACCESS-TSN	LATSN	LAST-ACC-TSN	LAST-ACCESS-TSN
LAST-ACCESS-USER-ID	LAUSERID	LAST-ACC-USER-ID	LAST-ACCESS-USER-ID
LAST-CLOSE-DATE	XCLDATE	LAST-CL-DATE	LAST-CLOSE-DATE
LAST-CLOSE-TIME	CLTIME	LAST-CL-TIME	LAST-CLOSE-TIME
MESSAGE-KEY	ERRORKEY	Only internal	Only internal

(part 2 of 3)

Volume catalog entry field	Field name in the DSECT of the macro MARENA	Field name in the output of SHOW-VOLUME-ATTRIBUTES	S variable name in the output of SHOW-VOLUME-ATTRIBUTES
OPEN-TYPE	OPENTYP	OPEN-MODE	OPEN-MODE
PASSWORD	PASSWORD	PASSWORD	PASS
RECORD VERSION	ARCHMAVE	Only internal	Only internal
REGISTRATION-DATE	VOLRGDAT	REG-DATE	REG-DATE
REMARK	BEMERKG	REMARK /1	REMARK
REMARK 2	BEMERKG2	REMARK /2	REMARK -2
REMARK 3	BEMERKG3	REMARK /3	REMARK -3
RESERVATION-COUNT	RESCOUNT	RESERV-COUNT	RESERV-COUNT
RESERVATION-DATE	XARCHDATE	RESERV-DATE	RESERV-DATE
RETURN-INFORMATION	RETURNFLAG	Only internal	Only internal
SUB-SAVE-NUMBER	SUBSAV#	SUBSAVE	SUBSAVE
SUBSEQUENCE-NUMBER	SUBSEQ#	SEQ	SUBSEQ
SVID/SFID FROM ARCHIVE/HSMS	SAVEVER	SAVE-FILE	SFID
TEMPORARY-LOCATION	TEMPLOC	TEMP-LOCATION	TEMP-LOCATION
TO (INTERVAL)	NUMMEND	Only internal	Only internal
USER ACCESS	SHARE	USER-ACC	USER ACCESS
USER-FIELD	USERFELD	USER-FIELD	USER-FIELD
USER-IDENTIFICATION	OWNERID	USER-ID	USER-ID
VOLUME	ARCHIVNR	VOLUME	VOL
VOLUME-GROUP	VOLGROUP	VOL-GROUP	VOL-GROUP
VOLUME-SEQUENCE	VSEQ	VOL-SEQ	VOL-SEQ
VOLUME-STATUS	STATUS	VOL-STATUS	VOL-STA (In a tape) VOL-STA-1 (In a tape list)

(part 3 of 3)

14.2 Function names in MAREN

The following table provides an overview of the function names employed by the individual components in the MAREN system. A number of these function names are also appended to individual archive entries (e.g. LAST-ACCESS-FUNCTION-NAME field). The function name in the archive or logging entry can thus be used to identify the operation which last modified the archive entries.

FUNCTION-NAME	READ	WRITE	RESERVE	other	Meaning
ADD	x			x	MARENADM statement ADD-RESERVED-VOLUME
ADDBYCAT	x			x	MARENADM statement ADD-RES-VOL VOL=*BY-TSOSCAT
ADDFDT				x	MARENADM statement ADD-FOREIGN-DEVICE-TYPE
ADDFREE	x			x	MARENADM statement ADD-FREE-VOLUMES
ADDHOST				x	MARENADM statement ADD-HOST
ADDPRIV ?	x			x	MARENADM statement IMPORT-FOREIGN-VOLUME
CATANPA	x			x	MAREN catalog adaption in MARENCP
CHANGLOG				x	MARENADM statement CHANGE-LOGGING-FILE
CHECK	x	x		x	MAREN statement CHECK-TSOSCAT
CHECK1	x	x		x	MARENADM statement CHECK-TSOSCAT
CLOSE				x	MARENADM statement CLOSE-MAREN-FILES
COPYCAT				x	MARENADM statement COPY-VOLUME-CATALOG
DELETE	x			x	MAREN statement DELETE-VOLUME-ENTRY
EDIT	x				MAREN statement EDIT-VOLUME-ATTRIBUTES
EDIT1	x				MARENADM statement EDIT-VOLUME-ATTRIBUTES
EDITMP	x				MARENADM statement EDIT-MAREN-PARAMETERS
FREE	x	x		x	MARENADM statement FREE-VOLUMES
GET	x	x		x	MAREN statement EXPORT-VOLUME
GET1	x	x		x	MARENADM statement EXPORT-VOLUME
INFO	x			x	MAREN statement SHOW-VOLUME-ATTRIBUTES
INFO1	x			x	MARENADM statement SHOW-VOLUME-ATTRIBUTES
INIT	x	x		x	MARENADM statement INITIALIZE-VOLUMES
MARARCHU	x	x		x	Program MARENADM.ARCHIVE
MARENADM				x	Initialization of MARENADM

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FUNCTION-NAME	READ	WRITE	RESERVE	other	Meaning
MARENCM				x	MAREN-FILE-ENTRY commands
MARENFA1			x		Free tape from ARCHIVE
MARENFA2	x	x	x		ARCHIVE statements SAVE, EXPORT, POOL, PURGE and the corresponding HSMS statements
MARENFA3	x	x			ARCHIVE statements EXPORT, IMPORT and the corresponding HSMS statements
MARENSV	x	x		x	SVC 43 handling
MARENUCP	x	x	x	x	Automatic free tape allocation facility MARENUCP
MAREN0C1	x	x			DMS-CLOSE
MAREN0D					DMS calls from MAREN subsystem
MAREN0E1	x	x			DMS reel change
MAREN0E2	x	x		x	DMS reel change
MAREN0F0	x				DMS device completion
MAREN0F1				x	File request
MAREN0FF	x			x	FILE get foreign VSN
MAREN0N	x				NDM device management
MAREN0NR		x			NDM device management
MAREN0NS		x			NDM device management
MAREN0O1	x				DMS-OPEN
MAREN0O2	x	x		x	DMS-OPEN
MODASCOP				x	MARENADM statement MODIFY-ADMINISTRATION-SCOPE
MODDOMAS				x	MARENADM statement MODIFY-DOMAIN-ASSIGNMENT
MODDOMPA				x	MARENADM statement MODIFY-DOMAIN-PARAMETERS
MODGLOBP				x	MARENADM statement MODIFY-GLOBAL-PARAMETERS
MODIFY	x	x		x	MAREN statement MODIFY-VOLUME-ATTRIBUTES
MODIFY1	x	x		x	MARENADM statement MODIFY-VOLUME-ATTRIBUTES
MODPAR				x	MARENADM statement MODIFY-MAREN-PARAMETERS
MODTSET		x		x	MAREN statement MODIFY-TAPE-SET-ATTRIBUTES
MODTSET1		x		x	MARENADM statement MODIFY-TAPE-SET-ATTRIBUTES
MOUNT	x	x		x	MAREN statement MOUNT-VOLUME
OFFLINE	x	x		x	OFFLINE

(part 2 of 3)

FUNCTION-NAME	READ	WRITE	RESERVE	other	Meaning
OPEN				x	MARENADM statement OPEN-MAREN-FILES
PRVOL				x	MAREN-/MARENADM statement PRINT-VOLUME-ATTR
PRVOL1				x	MARENADM statement PRINT-VOLUME-ATTR
RECEIVE	x	x		x	MARENADM statement IMPORT-VOLUME
REMFDT				x	MARENADM statement REMOVE-FOREIGN-DEVICE-TYPE
REMFREE	x			x	MARENADM statement REMOVE-FREE-VOLUMES
REMHOST				x	MARENADM statement REMOVE-HOST
REMOVE	x			x	MARENADM statement DELETE-VOLUME-ENTRY
REMUSER	x			x	MARENADM statement REMOVE-USER-VOLUMES
RENFDT				x	MARENADM statement RENAME-FOREIGN-DEVICE-TYPE
RESERVE			x	x	MAREN statement RESERVE-FREE-VOLUME
RESERVE1			x	x	MARENADM statement RESERVE-FREE-VOLUME
RETOPROG				x	MAREN-/MARENADM statement RETURN-TO-PROGRAM
RETURN	x	x		x	MARENADM statement RETURN-VOLUMES
SECFREE	x	x		x	MARENADM statement SECURE-FREE-VOLUMES
SHOWADMS				x	MARENADM statement SHOW-ADMINISTRATION-SCOPE
SHODOMPR				x	MARENADM statement SHOW-DOMAIN-PARAMETERS
SHOGLOPR				x	MARENADM statement SHOW-GLOBAL-PARAMETERS
SHOWFILE	x				MARENADM statement SHOW-MAREN-FILE
SHOWFREE	x			x	MARENADM statement SHOW-FREE-VOLUMES
SHOWPAR				x	MARENADM statement SHOW-MAREN-PARAMETERS
SHOWSTAT				x	MARENADM statement SHOW-MAREN-STATUS
SHOWVSNS				x	MARENADM statement SHOW-VSNS
SHWFDT		x		x	MARENADM statement SHOW-FOREIGN-DEVICE-TYPES
STOPCP				x	MARENADM statement STOP-CONTROL-PROGRAM
TAPESET1	x			x	Find all tapes in a tape set
UPDATE				x	MARENADM statement UPDATE-MAREN-CATALOG
VERIFY				x	MARENADM statement VERIFY-MAREN-CATALOG
WRITERAV				x	MARENADM statement WRITE-ACCOUNTING-RECORDS

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14.3 MAREN service accounting

The MAREN system provides a means of charging for certain volume archiving services. It can produce accounting records for:

- reserved computer center tapes (service type 430)
- archived foreign tapes (service type 430)
- exporting volumes (service type 432)

By specifying an accounting period in the MARENADM statement WRITE-ACCOUNTING-RECORDS (using the FROM-DATE and TO-DATE operands), it is possible to evaluate the current MAREN catalog and if necessary an additional logging file (specified in the LOGGING-FILE operand). The resulting accounting records are written to a SAM file (OUTPUT-FILE operand). The accounting records are created in a format which can be processed using the RAV utility routine (see the “RAV” manual [17]).

MAREN generates accounting records as follows:

- The current MAREN catalog is first evaluated. Thus accounting records are generated for service types 430 and 431. In addition to the user ID and account number, these records include information on the reservation period (beginning, end, and number of days). If the reservation period lies outside the accounting period, the start and end date are specified.
- If a logging file is specified, accounting records are then generated for magnetic tapes and disks which were reserved during the accounting period but which have since been released or reallocated.
  The information in the logging file is also used to produce accounting records for service type 432 if a computer center volume has been exported using the EXPORT-VOLUME statement or a private volume has been returned. The start and end date are taken from the EXPORT-DATE, and the number of days is set to “1”.

Format of the accounting records

Field no.	Offset hex.	Offset dec.	Length (bytes)	Format	Meaning
1	00	0	4	B	Record length field (X'00734040')
2	04	4	2	A	Record type (C'H4')
3	06	6	8	A	System (C'41AR␣␣␣␣')
4	0E	14	8	A	User ID from the catalog entry
5	16	22	8	A	Account number from the catalog entry
6	1E	30	8	A	User configuration (blanks)
7	26	38	8	A	Reserved (blanks)
8	2E	46	8	A	Job name (blanks)
9	36	54	1	A	Accounting type (blanks)
10	37	55	8	A	Start date in the format ddmmyyyy
11	3F	63	4	A	Start time in the format hhmmss
12	43	67	8	A	End date in the format ddmmyyyy
13	48	75	4	A	End time in the format hhmmss
14	4F	79	3	A	Performance type (C'430', C'431' or C'432')
15	52	82	8	A	Number of days in the accounting period in the format C'␣␣␣␣␣␣nn'
16	5A	90	4	A	TSN (blanks)
17	5E	94	7	A	Fill characters (blanks)
18	65	101	14	A	Comment in the format C'aaaaaa/mm.yyyy' aaaaaa: Archive number (VSN) mm.yyyy: Month and year of expiration date

Corresponding fields in the COBOL structure of RAV V5.0

Field no.	Meaning	Field name in the COBOL structure
1	Record length field (X'00734040')	
2	Satzart (C'H4')	HA-KA
3	System (C'41AR␣␣␣␣')	HA-CPUID/ HA-KF-KEY
4	User ID from the catalog entry	USERID
5	Account number from the catalog entry	HA-ACCNR
6	User configuration (blanks)	HA-BRKF
7	Reserved (blanks)	HA-ACCID
8	Job name (blanks)	HA-JOB-NAME
9	Accounting type (blanks)	HA-VERR-ART
10	Start date in the format ddmmyyyy	HA-VON-DATUM/HA-START-DATUM
11	Start time in the format hhmmss	HA-VON-ZEIT/HA-START-ZEIT
12	End date in the format ddmmyyyy	HA-BIS-DATUM/HA-ENDE-DATUM
13	End time in the format hhmmss	HA-BIS-ZEIT/HA-ENDE-ZEIT
14	Leistungsart (C'430', C'431' oder C'432')	HA-LEIST-ART
15	Number of days in the accounting period in the format C'␣␣␣␣␣␣nn'	HA-MENGE
16	TSN (blanks)	HA-FILLER
17	Fill characters (blanks)	TSN
18	Comment in the format C'aaaaaa/mm.yyyy' aaaaaa: Archive number (VSN) mm.yyyy: Month and year of expiration date	HA-BEMERKUNG

14.4 Aliases for statements and commands

The most commonly used statements for MARENADM, MARENEKM and MAREN as well as the MAREN commands also have an alias that is documented in the syntax format next to the name of the command as its “alias”.
The alias consists of a maximum of 5 characters (A...Z). The alias is derived from the name of the statement or command. Parts of names are always abbreviated in the same manner (e.g. SH for SHOW).
In some cases there may be two aliases (e.g. CL and CLMF for CLOSE-MAREN-FILES). The alias is guaranteed to be valid in the long term. It is not possible to abbreviate the alias.

The following tables contain all aliases for MARENADM/MARENEKM statements together with the administrator roles involved and also those for MAREN statements and MAREN commands.

Aliases for MARENADM statements

Statement	Alias	Privilege
ADD-FOREIGN-DEVICE-TYPE	ADFDT	ADA, administrator without domains
ADD-FREE-VOLUMES	ADFV	ADA, administrator without domains
ADD-HOST	ADHO	ADA, administrator without domains
ADD-RESERVED-VOLUME	ADRV	ADA, administrator without domains
CHANGE-LOGGING-FILE	CHLF	ADA, DA, administrator without domains
CHECK-TSOSCAT	CHTS	ADA, DA, administrator without domains (only TSOS)
CLOSE-MAREN-FILES	CLMF	ADA, DA, administrator without domains
COPY-VOLUME-CATALOG	CPVC	ADA, DA, administrator without domains
DELETE-VOLUME-ENTRY	DLVE	ADA, DA, administrator without domains
EDIT-MAREN-PARAMETERS	EDITMP	ADA, DA, administrator without domains
EDIT-VOLUME-ATTRIBUTES	EDIT	ADA, DA, administrator without domains
ENTER-MAREN-PROCEDURE	ENMP	ADA, DA, administrator without domains
EXPORT-VOLUME	EXV	ADA, DA, administrator without domains
FREE-VOLUMES	FRV	ADA, DA, administrator without domains
IMPORT-FOREIGN-VOLUME	IMFV	ADA, DA, administrator without domains
IMPORT-VOLUME	IMV	ADA, DA, administrator without domains
INITIALIZE-VOLUMES	INV	ADA, DA, administrator without domains
MODIFY-ADMINISTRATION-SCOPE	MDAS	ADA, DA

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Statement	Alias	Privilege
MODIFY-DOMAIN-ASSIGMENT	MDDA	ADA
MODIFY-DOMAIN-PARAMETERS	MDDP	ADA
MODIFY-GLOBAL-PARAMETERS	MDGP	ADA, administrator without domains
MODIFY-MAREN-PARAMETERS	MDMP	ADA, DA, administrator without domains
MODIFY-TAPE-SET-ATTRIBUTES	MDTSA	ADA, DA, administrator without domains
MODIFY-VOLUME-ATTRIBUTES	MD / MDVA	ADA, DA, administrator without domains
OPEN-MAREN-FILES	OPMF	ADA, DA, administrator without domains
PRINT-VOLUME-ATTRIBUTES	PR / PRVA	ADA, DA, administrator without domains
REMOVE-FOREIGN-DEVICE-TYPE	RMFDT	ADA, administrator without domains
REMOVE-FREE-VOLUMES	RMFV	ADA, DA, administrator without domains
REMOVE-HOST	RMHO	ADA, administrator without domains
REMOVE-USER-VOLUMES	RMUV	ADA, administrator without domains
RENAME-FOREIGN-DEVICE-TYPE	RNFDT	ADA, administrator without domains
RESERVE-FREE-VOLUME	RSFV	ADA, DA, administrator without domains
RETURN-VOLUMES	RTV	ADA, DA, administrator without domains
SECURE-FREE-VOLUMES	SCFV	ADA, DA, administrator without domains
SHOW-ADMINISTRATION-SCOPE	SHAS	ADA, DA
SHOW-DOMAIN-PARAMETERS	SHDP	ADA, DA
SHOW-FOREIGN-DEVICE-TYPES	SHFDT	ADA, administrator without domains
SHOW-FREE-VOLUMES	SHFV	ADA, DA, administrator without domains
SHOW-GLOBAL-PARAMETERS	SHGP	ADA, administrator without domains
SHOW-MAREN-FILE	SHMF	ADA, DA, administrator without domains
SHOW-MAREN-PARAMETERS	SHMP	ADA, DA, administrator without domains
SHOW-MAREN-STATUS	SHMS	ADA, DA, administrator without domains
SHOW-VOLUME-ATTRIBUTES	SH / SHVA	ADA, DA, administrator without domains
STOP-CONTROL-PROGRAM	STCP	ADA, DA, administrator without domains
UPDATE-MAREN-CATALOG	UPMC	ADA, DA, administrator without domains
VERIFY-MAREN-CATALOG	VRMC	ADA, DA, administrator without domains
WRITE-ACCOUNTING-RECORDS	WRAR	ADA, DA, administrator without domains

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Aliases for MARENEKM statements

Statement	Alias	Privilege
ADD-ENCRYPTION-KEY	ADEK	Encryption key administrator
COPY-ENCRYPTION-KEYS	CPEK	Encryption key administrator
CREATE-ENCRYPTION-KEY	CREK	Encryption key administrator
DELETE-KEY-BOX	DLKB	Encryption key administrator
EXPORT-KEY-BOX	EXKB	Encryption key administrator
IMPORT-KEY-BOX	IMKB	Encryption key administrator
MODIFY-VOLUME-ENCRYPTION-ATTR	MDVEA	Encryption key administrator
REMOVE-ENCRYPTION-KEYS	RMEK	Encryption key administrator
REPAIR-KEY-BOX	RPKB	Encryption key administrator
SET-WRITE-ENCRYPTION-KEY	STWEK	Encryption key administrator
SHOW-ENCRYPTION-KEYS	SHEK	Encryption key administrator
SHOW-VOLUME-ENCRYPTION-ATTR	SHVEA	Encryption key administrator

The encryption key administrator uses MARENEKM to manage encryption keys within the home domain.

To manage the encryption keys of another domain, he/she would first have to become the DA of this domain.

Aliases for MAREN statements

Statement	Alias
CHECK-TSOSCAT	CHTS
DELETE-VOLUME-ENTRY	DLVE
EDIT-VOLUME-ATTRIBUTES	EDIT
EXPORT-VOLUME	EXV
MODIFY-TAPE-SET-ATTRIBUTES	MDTSA
MODIFY-VOLUME-ATTRIBUTES	MD / MDVA
MOUNT-VOLUME	MTV
PRINT-VOLUME-ATTRIBUTES	PR / PRVA
RESERVE-FREE-VOLUME	RSFV
SHOW-VOLUME-ATTRIBUTES	SH / SHVA

Aliases for MAREN commands

Statement	Alias
ADD-MAREN-FILE-ENTRY	ADMFE
REMOVE-MAREN-FILE-ENTRY	RMMFE
SHOW-MAREN-FILE-ENTRY	SHMFE

Related publications

You will find the manuals on the internet at *http://manuals.ts.fujitsu.com*. You can order printed versions of manuals which are displayed with the order number.

[1] **MAREN** (BS2000)
Tape Management in BS2000
Basics and MAREN Application
User Guide

[2] **ASSEMBH**
Description

[3] **ARCHIVE** (BS2000)
User Guide

[4] **AVAS** (BS2000)
Functions
User Guide

[5] **BS2000 OSD/BC**
Commands
User Guide

[6] **BS2000 OSD/BC**
System Installation
User Guide

[7] BS2000 **OSD/BC**
System Exits
User Guide

[8] **BS2000OSD/BC**
Introduction to System Administration
User Guide

[9] **ETERNUS CS**
Operating and Administering the ETERNUS CS High End
User Guide

[10] **FDDRL** (BS2000)
User Guide

[11] **FHS** (BS2000)
User Guide

[12] **HIPLEX MSCF** (BS2000)
BS2000-Processor Networks
User Guide

[13] **HSMS** (BS2000)
Hierarchical Storage Management System
User Guide

[14] **IMON** (BS2000)
Installation Monitor
User Guide

[15] **JV** (BS2000)
Job Variables
User Guide

[16] **LMS** (BS2000)
User Guide

[17] **RAV** (BS2000)
Computing Center Accounting Procedure
User Guide

[18] **RFA** (BS2000)
Remote File Access
User Guide

[19] **ROBAR** (BS2000)
Controlling MTC Archiving Systems
User Guide

[20] **SDF** (BS2000)
SDF Dialog Interface
User Guide

[21] **SECOS** (BS2000)
Security Control System - **Access Control**
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[22] **SORT** (BS2000)
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[23] **SPOOL & PRINT Commands** (BS2000)
User Guide

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